Department of Conservation and Recreation
Division of State Parks and Recreation
Bureau of Forestry

Federation of Women's Clubs State Forest

Land and Resource Management Plan (Forest Plan)
Management Forestry Program

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A. Purpose, Need, and Guiding Principles

The purpose of the Federation of Women's Clubs State Forest (FWC) Land and Resource Management Plan (Forest Plan) is to:

- Develop a long-term strategy (105 years) for the management of the FWC.
- Develop a short-term (next 15 years) implementation schedule to meet the desired conditions of the forest plan.
- Provide resource management implementation and monitoring.
- Meet Forest Stewardship Council green certification standards for the FWC.

The FWC Forest Plan is needed to:

- Meet the Commonwealth of Massachusetts forest management legal mandates and strategic goals and objectives. (See Appendix F)
- Address the natural resource management issues identified by the public
- Inform the public on how the FWC shall be managed.
- Provide comprehensive long-term forest management guidance and specific short-term implementation and monitoring direction to land managers.
- Integrate all resources such as vegetation, wildlife, rare plants and animals, soils and water, recreation, cultural resources and infrastructure into a comprehensive land management strategy.

The FWC Forest Plan was prepared based on the following planning principles:

- The Forest Plan will consider the larger landscape scale patterns, and surrounding activities.
- The Forest Plan will be adaptable and change over time as new biological and social conditions and information becomes available.
- The Forest Plan will consider ecological, social, and economic factors to determine how best to manage the natural resources.
- Resource management will be biologically and economically sustainable and environmentally sensitive.
- The Forest Plan will be focused on providing clear strategic, implementation, and monitoring direction.
- The Forest Plan will describe key present conditions, desired conditions, goals, and objectives.
- Forest management shall be according to sound silvicultural practices and in consideration of ecological principles.
- The Forest Plan was developed with the best information and data available.

B. Property History

1. Prehistoric Overview

Existing archaeological evidence suggests that Paleo Indian hunters and gatherers reached the Swift River drainage approximately 9,500 to 12,000 years ago. By about 9,500 years ago the warming climate had created an environment in southern New England that supported a mixed pine-hardwood forest.

During the *Middle Archaic period* (ca. 8,000 - 6,000 years ago) climatic and biotic changes continued and the mixed deciduous forests of southern New England were established. The present migratory patterns of many fish and birds are believed to have become established at this time (Dincauze 1974). During the spring, rivers, streams and ponds were well stocked with spawning anadromous fish. Fishing was very important to the subsistence lifestyle. Groups are likely to have traveled considerable distances to camp adjacent to falls and rapids where they could easily trap and spear the salmon, herring, shad and alewives.

At least twenty-four sites within the Quabbin Watershed have yielded diagnostic evidence of *Late Archaic period* (ca. 6,000 to 3,000 years ago) materials. This marked increase in site frequencies and densities is consistent with findings throughout most of southern New England, and may reflect a population increase during this period.

During the *Early, Middle* and *Late Woodland* periods (3,000 - 450 years ago) Native Americans continued to occupy the Swift River drainage. Regionally, horticulture was introduced during the Early Woodland and small gardens may have been planted in clearings located on the fertile alluvial terraces next to the Swift River and its larger tributaries.

2. Historic Overview

By 1736, with grants of 1,000 acres, colonists were drawn to the Swift Valley by its water resources for manufacturing purposes and the valley's rich alluvial soils. Over the ensuing century, the communities in the Swift River Valley prospered but remained small in size with rural characteristics. The present landscape consists of a maze of stone walls, farm roads, wells, and refuse piles that further document the historic land use of the Swift River Valley.

On October 9th 1930 at a ceremony attended by,"…a large number of club women and conservationists.", the Massachusetts Federation of Women's Clubs presented the deed for a 34 acre tract of land in Petersham to Department of Conservation Commissioner, A. L. Bazeley. This tract became the nucleus of the 1,007 acre FWC state forest.

The FWC was site of the CCC Camp S-89 established in the summer of 1935 on the Riceville Pond tract of the Petersham State Forest. In 1936 this camp was closed and replaced by Camp S-62 (Wendell, Ruggles Pond).

In 1936, acting on the advice of the Division of Fisheries and Game, the CCC established eighteen "Wildlife Refuges" on the state forests. These areas served as wildlife

sanctuaries where hunting was not allowed. One 140 acre wildlife refuge was located in southeast corner of FWC; hunting was already prohibited in this area by deed.

On September 21, 1938 the Great Hurricane of 1938 struck central Massachusetts. The FWC suffered considerable damage. Heavy rain swelled streams and damaged roads and the three new bridges. High winds leveled "All the merchantable pine and large numbers of hardwood trees…". Shortly after the storm, a crew from the Northfield CCC Camp was dispatched to FWC to clear the roads. In October, a crew of sixty men from the Benjamin Foster Company of Philadelphia began the cleanup and salvage of the storm-damaged trees. During the winter and spring of 1939, 306,000 board feet of the "better" timber was salvaged and sold to the Northeast Timber Salvage Administration although there remained "…a large amount of down pine and hardwood timber which should be cleaned up to properly protect the forest from fire."

Hurricane cleanup work was the state's highest priority for the next several years. Eventually, World War II led to the end of the CCC. The era during World War II and the Korean Conflict was a period of limited staffing and funding for the Department of Conservation. As the post-war economy recovered in the late 1950s, the public had both the means and the leisure time to visit the state forests. The FWC was staffed seasonally first as a satellite of the Wendell State Forest and later, of the Otter River State Forest and attendance at its picnic area increased through the 1960s and 1970s. Hunting and use of the primitive camping area were popular activities.

Within the last 20 years, low density residential development has occurred adjacent to the FWC. The FWC is used by hunters, hikers, mountain bikers, wildlife watchers, and a few campers.

The FWC has been identified as a focus forest for the Mid State Management Forestry District. A focus forest is intended to be an area dedicated to demonstrating a high level of natural resource management that is ecologically and environmentally sound. This demonstration forest will also serve as an educational opportunity for schools and the general public through brochures and self guided interpretation.

Date of Acquisition: 1930-1933
Size of ownership: 1007 acres
Percent forested 1830: 36%
Percent forested 1938: 89%
Percent forested 2003: 92%

C. Public Issues and Opportunities:

The following are public issues identified in the Lower Worcester Plateau Ecoregional guidance document as they pertain to the FWC.

Conserving Biodiversity

Issue 1: Historic land use has resulted in predominately mid-seral stage forests with a shortage of both large blocks of older and younger forests in contiguous blocks. This simplified condition may result in a loss of structural, compositional and functional biological diversity.

The FWC has an opportunity to improve biological diversity by improving the composition, structure, and function of the forest.

Issue 2: Changing land use and ownership patterns have fragmented the landscape. Ecological conditions and processes associated with large unbroken blocks of forests may not be occurring or are not achievable.

The FWC has an opportunity to provide a large block of forest where some natural disturbance processes can be mimicked through forest management.

Issue 3: Non-native invasive species threaten native diversity, limit forest regeneration, and reduce habitat viability. No comprehensive strategy has been developed or promoted to meet this threat.

The FWC provides an opportunity to limit new occupations of non-native invasive species and treat existing populations.

Forest Conditions, Health and Productivity

Issue 4: There is a concern that forests in general are being managed poorly.

The FWC has an opportunity to demonstrate forest management that results in a healthier forest over an infinite tenure of public ownership. As a focus forest, FWC will be used to provide educational opportunities on the values of long-term forest stewardship.

Issue 5: Hemlock wooly adelgid threatens the hemlock forests and biological diversity. The pace and extent of hemlock mortality, effective biological controls, and marketability of products are unknown.

The FWC has an opportunity to anticipate and mitigate the impacts of the hemlock wooly adelgid.

Issue 6: Large continuous blocks of oak forests are of exceptional value for wildlife habitat and timber products. The oak forests are under threat from over harvesting and pests such as gypsy moth.

The FWC has an opportunity to maintain healthy oak forests for wildlife habitat and timber products, and demonstrate effective oak regeneration silviculture.

Issue 7: There is a concern about global issues such as acid deposition, ozone depletion, and global warming.

The FWC has an opportunity to contribute at a local level by maintaining healthy forests and producing sustainable wood products.

Soil and Water Conservation

Issue 8: Forests protect and enhance the quality of drinking water for the population of Massachusetts. These values can be threatened by natural and man-made disturbances.

The FWC has an opportunity to improve the long-term health of the watershed by maintaining forests that are more resilient to small scale and catastrophic natural disturbances such as erosion, insects, diseases, fire, wind, ice and snow damage.

Issue 9: Unregulated (or inadequately patrolled) motorized vehicle travel on forest land has resulted in the degradation and erosion of soils, reducing forest productivity and water resource protection.

The FWC protects soils by only allowing motorized vehicles on approved forest roads and has an opportunity to maintain and repair or close existing roads.

Socio–Economic Factors

Issue 10: Rural communities rely on forests to provide many social and economic benefits. These expectations often conflict with other societal values and needs.

The FWC has an opportunity to work with the public and develop a forest plan that is accepted because it carefully balances ecological, social, and economic factors.

Issue 11: Massachusetts only produces approximately 2% of the wood that it uses. Much of the timber harvested is exported for processing and local mills are closing.

The FWC has an opportunity to produce high quality forest products in a sustainable environmentally responsible manner.

The Bureau will respond to these issues in several different resource areas on the FWC. The following table presents the issues and identifies resource areas where specific management guidelines and objectives have been identified to partially or fully address the issue.

	Resource Area											
	Vegetation	Cultural Features	Infrastructure and Recreation	Forest Health	Water Features	Soils	Special Features	Biodiversity: and Rare Species	Fire	Forest Products	Inventory, Monitoring, and Evaluation	Public Involvement
Issue 1	☒	☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐
Issue 2	☒	☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐
Issue 3	☒	☐	☐	☒	☐	☒	☐	☐	☐	☐	☐	☐
Issue 4	☒	☐	☐	☒	☐	☐	☒	☐	☐	☒	☒	☒
Issue 5	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐	☐	☐
Issue 6	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Issue 7	☐	☐	☐	☒	☐	☒	☐	☐	☐	☐	☐	☐
Issue 8	☐	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	☐
Issue 9	☐	☐	☒	☐	☒	☒	☐	☐	☐	☐	☐	☐
Issue 10	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	☐
Issue 11	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	☐

D. FWC Regional Landscape

The FWC State Forest is located in north central Massachusetts. This area has been classified as the Worcester Plateau Eco-Region and is considered to be a transition area between the central hardwoods of southern New England and the Northern Harwood types. The Worcester Plateau is also an east west transition area between the moraines (hills) and sandy plains of eastern Massachusetts and the Connecticut River Valley and Berkshire Mountains of western Massachusetts. This results in a large area of glaciated

terrain with till soils and mixed stands of eastern white pine and both central and northern hardwoods. This area has one of the highest percentages of protected open space in the Commonwealth. This is a result of many factors including the historically agriculture nature of these towns, their location in the Quabbin Reservoir watershed, and the early location of Harvard's school of forestry in the area. The present landscape is characterized by forests and dispersed, sparse residential development.

Supporting Map(s) Figure 01 - FWC Regional Landscape
Figure 02 – Protected Open Space

The FWC landscape consists of about 238,000 acres with the following ownership pattern:

• County	161 acres
• Federal	725 acres
• Municipal	4,574 acres
• State (DCR, DSPR)	13,108 acres
• State (DCR, DWSP)	48,584 acres
• State (DFG)	10,798 acres
• State (Other)	452 acres
• Private	159,598 acres

FWC Acres by Town: Petersham (994 acres), New Salem (13 acres)

Adjacent and nearby protected lands provide increased values, protection of core areas, and opportunities for cooperative management. Adjacent protected properties are:

- **DCR, Division of Water Supply Protection** – Quabbin Watershed Lands,
- **DCR, Division of Water Supply Protection -** William Foye Conservation Restriction, 166 acres
- **Department of Fish and Game** – Sputtermill Pond Access Area, 65 acres

Nearby protected properties include:

- **Harvard University** – Harvard Forest, 2760 acres
- **The Trustees of Reservations** – James W. Brooks Preserve, 566 acres
  Swift River Reservation, 423 acres
- **Department of Fish and Game** – Popple Camp WMA – 1346 acres
- Phillipston WMA – 3573 acres
- Raccoon Hill WMA – 431 acres
- **DCR, Division of State Parks and Recreation –** Riceville State Forest, 644 acres
- **Forest Legacy Program** – CR held by US Forest Service – GMO Forestry Fund **–** 490 acres
- **Forest Legacy Program** – CR held by US Forest Service – Two Mile Land Bridge **–** 467 acres

- **Private Ch61 and 61A properties** - 26,091 acres

Protected open space and current use properties (Chapter 61 and 61A) totals 118,832 acres representing 50% of the 10 mile radius landscape.

Supporting Maps – Figure 01 – Regional Landscape

E. Vegetation

1. Present Condition

The terrain and vegetative cover of the FWC State Forest is typical of north central Massachusetts. The forest vegetation consists primarily of white pine/hardwood (25%), white pine/hemlock (16%), mixed oak (16%), white pine/oak (12%), and white pine (10%) forests. Hemlock, hemlock/hardwood, and red oak forest types also occur in the forest in smaller acreages.

For the most part, the forest is made up of stands that have been classified as small sawlog size (over 11" DBH). The mean stand diameter ranges from 10.0 inches DBH to 16.8 inches. The majority of the stands have a mean stand diameter between 12.1 and 14.0 inches.

Seventy seven percent of the forest stands are considered to be fully stocked, eighteen percent are overstocked and four percent are understocked.

The age distribution of the FWC State Forest ranges from 57 years old to 115 years old. Most of the stands are between 68 and 80 years. Many of the stands were naturally regenerated after the 1938 hurricane, or were young at that time, and not severely impacted by the event. The impact of the hurricane can still be seen in the pits and mounds created when many trees were blown over. Some stands have been previously managed by thinning and shelterwood regeneration systems. The shelterwood systems have resulted in an abundance of desirable, well stocked, healthy regeneration. There is evidence of some white pine overstory mortality due from wind damage to mature and over-mature trees.

Supporting Map(s) Figure 03 – Forest Type
Figure 04 – Merchantable Mean Stand Diameter
Figure 05 – Age Class
Figure 06 – Site Index
Figure 07 – Vegetation Management
Figure 07A – Age Class Distribution

The following is a summary of the acreage on the FWC State Forest classified into types for management purposes. (See Appendix A for Detailed Forest Cover Types and Stand Exam Data):

Forest Type	Present Condition 2003 Acres	Desired Condition 2108 Acres
Oak-Pine		
General Forest	757	685
Reserve	4	126*
Filter Strip	47	41
Forested Wetland	21	12
Recreation Area	20	20
Total	**849**	**884**
Hemlock		
General Forest	64	0
Reserve	4	29*
Filter Strip	2	0
Forested Wetland	10	0
Total	**80**	**29**
Non-Forested Wetlands		
Deep Marsh	16	16
Shallow Marsh	27	27
Shrub Swamp	13	13
Total	**56**	**56**
Upland Opening		
Power Line	22	22
Other Opening	0	16
Total	**22**	**38**
Total Acreage	**1007**	**1007**

*Includes 19 acres of forested wetland and 8 acres of filter strip.

2. Desired Condition:

The desired condition for vegetation within the FWC is a native, healthy forest that provides diverse habitats and aesthetically pleasing conditions. The forest is managed in a long- term manner that provides for the productivity and sustainability of the timber, wildlife, soils, and water resources. This forest condition reduces the risk of forest damaging agents such as wind, fire, insect, disease, and ice. As a result of management, a variety of forest products are produced in a sustainable and environmentally sensitive manner.

Age Class Distribution:

The following table summarizes the FWC's Current Age Class Distribution/Structure by Forest Cover Type and the short and long-term desired conditions:

White Pine-Oak Forest Types:

	Present Condition 2003	Desired Treatment By 2018	Short-term Condition: 2018	Long-term Condition: 2108
Upland Field	0	Establish upland field	16 acres	16 acres
0-14 years old Regeneration 0-2.4" DBH	0	No treatment	85 acres final removal of overstory	85 acres
15-59 years old Saplings & Poles 2.5-10.9" DBH	25 acres	No treatment	0 acres	254 acres
60-104-years old Sawlog 11-19.9 DBH	747 acres 39 acres filter strip	16 acres converted to upland field 85 acres final removal of overstory 75 acres shelterwood Thin high priority stands Total treatment: 176 acres plus thinning	25 acres grew from 15-59 age class 75 acres shelterwood 126 acres of reserve 39 acres of filter strip 445 acres no treatment or thinning Total: 710 acres	254 acres (includes 49 acres from hemlock type)
105+ years old Large Sawlog 20"+ DBH	0	No treatment	0 acres	126 acres reserve 41 acres of filter strip 86 acres extended rotation

Hemlock Forest Types

	Present Condition: 2003	**Desired Treatment By 2018**	**Short-term Condition 2018**	**Long-term Condition: 2108**
0-14-years old Regeneration 0-1.4" DBH	0	No treatment	0	0 acres
15-59-years old Saplings & Poles 1.5-10.9" DBH	5 acres	No treatment	0	0 acres
60-104-years old Sawlog 11-17.9 DBH	73 acres 2 acres filter strip	10 acres shelterwood (transition to pine-oak type)	10 acres shelterwood 29 acres reserve (5 acres grew from 10-59 age class) 39 acres 2 acres of filter strip Total – 80 acres	0 acres
105+ years old Large Sawlog 18"+ DBH	0	No treatment	0	29 acres reserve

3. Management Objectives and Guidelines:

General Guidance:

A. Restore and maintain native forests.

B. Consolidate management activities where possible for the purpose of emulating some natural disturbance processes, maximizing treatment effectiveness and efficiencies, and, if applicable, decreasing the edge effect from harvesting.

C. Conduct management activities in accordance with accepted silvicultural practices and guidelines.

D. Coordinate management activities where practicable, desirable and feasible with adjacent lands. Consider the surrounding local landscape patterns during the development of project level plans.

General Natural Resource Management Areas:

A. Manage the FWC white pine-oak forests (initially) on a 105-year rotation by establishing regeneration on approximately 12.5% and releasing existing regeneration on approximately 12.5% of the general natural resource management acres in each planning cycle.

B. Implement management on a 15-year treatment cycle.

C. Prioritize management to meet the following natural resource objectives :

1. Meet rare species habitat and biodiversity goals
2. Reduce the risks of catastrophic disturbances such as wildfires
3. Restore and maintain native ecosystems
4. Restore and maintain forest health
5. Provide a sustainable flow of forest products

D. Select stands for meeting the above management objectives by further prioritization based on the following goals:

1. Completing regeneration harvests in stands that have had previous work to establish or release existing regeneration
2. Regenerating stands that are at imminent risk of mortality from insects, disease, fire, etc.
3. Establishing regeneration in poorly stocked stands or in stands that are currently stocked with species that are ill suited to the site
4. Improving low quality stands

5. Regenerating mature stands
6. Thinning immature stands

E. Design harvests to favor white pine and oak regeneration through use of appropriate silvicultural techniques including the use of prescribed fire.

F. Manage approximately 12.5% of the general natural resource management acres in an extended rotation.

1. Select stands for extended rotation in areas that compliment Special Management Areas. Where possible, manage extended rotation stands according to silvicultural principles to promote healthy, over-mature, large diameter forest conditions.

2. Regeneration of extended rotation stands may be considered during the next and each 15-year planning cycle.

G. Thin overstocked forest stands that have a high percentage of acceptable growing stock. The most productive sites should be given the highest priority for treatment. Thinning should be scheduled early in the rotation.

Special Management Areas:

A. Reserves: Identify at least 20% of state forest lands on a statewide basis to be managed as reserve areas in the following manner: (percentages may vary on individual state forests)

1. Design reserve areas to provide for bio-diversity, baseline representation of all ecological land types, and educational and passive recreational opportunities. Reserves will provide a baseline for studying natural conditions and processes, provide habitat for rare species, protect sensitive areas, and protect rare landforms.

2. Consolidate reserves where possible within high conservation value forests, natural heritage emphasis areas, rare landforms and adjacent lands with reserves.

3. Avoid active management in reserve areas unless there is a need to restore native vegetation and natural processes or address critical and significant forest health and public safety issues.

4. Reserve approximately 208 acres (approximately 20%) of the FWC in the following areas (See appendix 07):
    a. Non-forested wetland – 56 acres
    b. Lands in and adjacent to Natural Heritage polygon and wetland complex area – 148 acres

c. Inaccessible areas – 4 acres

B. Recreation Areas: Manage vegetation in recreation areas and along designated scenic roads in a way that recognizes aesthetic and visual objectives, safety considerations, forest health and natural processes.

C. Filter Strips: Manage filter strip vegetation in accordance with the Massachusetts MGL 132 and MA Forestry Best Management Practices.

D. Upland Field: Create and maintain upland fields by periodic burning, mowing, grazing or other methods to meet the desired early successional wildlife habitat conditions such as fringed gentian, woodcock, ruffed grouse, and wild turkey.

Wildlife and Biological Legacy Structural Guidelines:

A. Retain on average at least one live, large diameter (where possible >18"dbh) cavity or den tree per 5 acres up to a maximum of one tree per acre either as individuals, or 1/4 to 1/3 acre groups or islands for cavity nesting species. Greater number of trees should be left in riparian areas. Retain 2-4 smaller diameter cavity trees where possible.

B. Retain as many snags and stubs as possible in harvested areas in compliance and consideration of O.S.H.A. "Danger Tree" regulations.

C. Retain on average one of the oldest, largest diameter, well formed, dominant trees (where possible > 18" dbh) per acre in harvested areas to serves as a legacy tree.

D. Maintain at least one cord (80 cubic feet) per acre of down coarse woody debris (material 4" or greater at the tip and at least 4' long) for ground dwelling amphibians, mammals, insects, and nutrient recycling. When available, high priority will be given to leaving large, cull logs that will remain for long periods of time.

F. Cultural Features

1. Present Condition

Cultural resources are important historical human artifacts that are provided for under Massachusetts Preservation legislation.

DCR's Cultural Resource Management program is designed to ensure that future generations will have the opportunity to understand, appreciate, and learn about the past.

The Division is concerned about proper management of historic and prehistoric cultural resources.

Supporting Map(s) Figure 08 – Cultural Features

The North Quabbin and FWC areas are rich in both historic and pre-historic resources. The following is a summary of the known cultural resources found within the FWC:

Number of Known Prehistoric Sites:	0
Number of Known Historical Sites:	
Total number of cellar holes	11
House Foundations	8
Barn foundations	2
Former Tavern site	1
Miles of Stone Walls:	
Stone walls	6.5 miles
Barbed wire fence	0.6 miles
Other fence	3.8 miles

2. Desired Condition:

The desired condition is to identify, protect, and maintain significant historic and pre-historic cultural resources within the FWC. In some case, cultural resources may be enhanced through management activities or interpreted for educational purposes.

3. Management Objectives and Guidelines

A. Inventory and identify all lands potentially impacted by management for pre-historic sites, cultural resources and artifacts by trained employees using methodologies developed by an archaeologist.

B. Prepare and submit the silvicultural prescription or project report to the Archaeologist for review when known or potential pre-historic sites, cultural resources and artifacts are located or identified during project implementation.

C. Protect cultural resources during project by:

1. Incorporating Archaeologist's recommendations for managing (protecting, restoring, maintaining and interpreting) potential and existing pre-historic sites, cultural resources and artifacts into the stand prescriptions.

2. Prohibiting activities that disturb the integrity of significant historical sites and features.

3. Minimizing soil disturbance (compaction, displacement, rutting) on potential and moderately to highly sensitive existing pre-historic sites.

4. Minimizing creation of new openings in stone walls. Repair any necessary opening(s) following the completion of the operation or stockpile removed stones if the opening will be used in the future.

5. Avoiding the placement of landings within 25 feet of cellar holes where possible.

6. Capping abandoned open wells in a manner that maintains the integrity of the historic feature.

D. Maintain or enhance cultural resources through careful removal of vegetation and woody debris when recommended by the Archaeologist.

E. Interpret cultural resources for educational purposes dependant upon feasibility and funding.

G. Infrastructure and Recreation

1. Present Condition

Recreational opportunities and aesthetic quality are important to forest users. The FWC is generally used for non-developed recreation. Uses include primitive camping, hiking, horseback riding, birding, nature study, mountain biking, and hunting.

Supporting Map(s) Figure 09 – Infrastructure and Recreation
Figure 09A – FWC Road Classification

The FWC infrastructure consists of boundaries, roads, trails, and a primitive camping area.

Boundaries: 6.8 miles
All boundaries have been located and marked to standard.

Roads:

Total State Forest Road Distance	5.2 miles
Type 1 Road (Total Paved)	1.8 miles
Type 3 Road (Total Gravel)	2.4 miles
Type 4 Road (Total Natural surface)	1.0 miles
Total Non-State Forest Road Distance	0.0 miles

Culverts and Bridges:

Total number of culverts and bridges	17
Functioning Culverts	17
Non – Functioning Culverts	0
Functioning Bridges	0
Non – Functioning Bridges	2

Trails:

Total Trail Distance	1.7 miles
Hiking trails	0.3 miles
Horseback / biking	1.4 miles

Recreation Facilities:

Primitive Camping Area 23 sites

Two outhouses and one composting toilet associated with camping area.

Recreational use:

Year	Number of Campers
1997	3418
1998	3208
1999	3413
2000	1649
2001	1275
2002	761
2003	547

2. Desired Condition:

The desired condition for recreation is to provide a range of recreational opportunities and settings that are consistent and compatible with natural resource management goals. Infrastructure will be adequately inventoried and maintained.

3. Management Objectives and Guidelines

A. Boundaries:

1. Identify all boundaries needing formal surveys.

2. Survey boundaries needed for project implementation, trespass, or where there are disputes. Other boundaries needing to be surveyed will be done upon the availability of funding.

3. Locate and maintain all boundaries on a 10 year cycle or when needed for project implementation.

4. Identify and maintain all boundaries clearly and in a way that is sensitive to adjacent private lands.

B. Roads:

1. No new permanent roads will be needed for administration or recreation in FWC.

2. Maintain roads in accordance to the Bureau's road classification system and maintenance policy.

3. Consider the use of in-kind services to provide for road maintenance during project planning and implementation.

4. Install two access gates (one on West Road and one on Route 122) to control access to the forest to minimize road damage and provide for public safety.

5. Close by rock barricade the gravel road within the reserve area.

6. Coordinate and cooperate with municipal officials on the management of roads and ownership of timber within road right-of-ways.

C. Trails:

1. Coordinate with the responsible park supervisor during project planning to minimize impacts on trails and potential conflicts with users and seek to provide new or improved opportunities through management.

2. Maintain the gravel road within the reserve area as a foot trail and replace the two failed bridges with appropriate structures to meet recreational needs. Post as closed and block roads leading up to the failed bridges.

3. Apply MA Forestry Best Management Practices and slash treatment techniques to minimize adverse effects to the trails.

4. Coordinate with Law Enforcement to patrol and enforce ORV regulation. ORV are prohibited within the FWC.

D. Recreation:

1. Coordinate with the responsible park supervisor during project planning to minimize impacts and conflicts to recreation sites and users.

2. Provide new or improved recreational opportunities depending on demand, feasibility and funding.

3. Develop a self-guided tour with specific points of interest and related educational information.

H. Forest Health Issues

1. Present Condition

Forests contain a variety of damaging agents that present Forest Health Issues. Insects, diseases, fire, wind, snow, ice, undesirable, non-native, invasive species are examples of damaging agents that are threats to the health of a forest.

Supporting Map(s) Figure 10 – Percent Species Composition in Hemlock
Figure 11 – Known Occurrences of Invasive Species

The major forest health issues in the FWC are:

Hemlock woolly adelgid (HWA)
Non-native invasive species:
Berberis thunbergii – Japanese barberry
Celastrus orbiculatus – Oriental bittersweet
Lonicera sp. – Honeysuckle

2. Desired Condition

The desired condition is a healthy, diverse, native forest with a reduced occurrence of undesirable, non-native, invasive species.

3. Management Objectives and Guidelines

A. Forest Insects and Diseases:

1. Conduct periodic surveys to identify and quantify forest insect and disease impacts.

2. Prescribe integrated pest management approaches that treat high-risk stands.

3. Address hemlock wooly adelgid risk by:
    a. Surveying hemlock stands outside of the reserve area with greater than 50% stocking of hemlock for the presence of HWA (Approximately 49 acres have over 50% of the basal area in mature hemlock).
    b. Considering hemlock stands for treatment (regeneration, thinning, or salvage) when the majority (greater than 50% of the hemlock trees) are infected with HWA.

B. Non-native Invasive Species:

1. Conduct periodic surveys to identify, map, and quantify impacts of non-native invasive species.

2. Prescribe integrated and interdisciplinary approaches that treat existing populations while maintaining desirable native species.

3. Take reasonable preventative measures during projects to limit the spread of existing and introduction of new populations.

4. Treat approximately 5 acres of barberry on the forest.

C. Use of Pesticides:

1. Use pesticides only when there are no other effective alternatives.

2. Apply pesticides according to product labels and by a licensed applicator.

3. Monitor treatments for effectiveness and impacts on non-target species and areas.

I. Water Features

1. Present Condition

The FWC has a variety of water related features such as streams, marshes, swamps, wetlands, and potential vernal pools.

Supporting Map(s) Figure 12 – Wetland Classification

Watershed:	Chicopee:	970 acres
	Millers:	37 acres

First order streams: 3.5 miles

Second order or greater streams: 0.7 miles

Total Wetlands:	87 acres
Deep marsh	16 acres
Shallow marsh	27 acres
Shrub Swamp	13 acres
Forested Wetland Oak-Pine	21 acres
Forested Wetland Hemlock	10 acres

Certified Vernal Pools:	0
Potential Vernal Pools:	3

Number of Ponds/Lakes: 0

Acres within filter strips (within 50' of streams and vernal pools): 41 acres

2. Desired Condition:

The desired condition is a forest which promotes and maintains the integrity of healthy, functioning aquatic ecosystems including appropriate vertebrate and invertebrate populations, water chemistry, nutrient input, and instream structure.

3. Management Objectives and Guidelines

A. Meet rare species habitat needs and MA Forestry Best Management Practices requirements.

B. Manage areas around all vernal pools according to the "Guidelines for Timber Harvesting near Vernal Pools". In addition:

1. All vernal pools (certified and non-certified) will have a no cut buffer within 15 feet of the high water mark of the depression. Silvicultural manipulations are limited to girdling in this area.

2. A 100 foot buffer around the pool edge will include only partial cuts in order to maintain acceptable microclimates for amphibians. The vegetative composition within the buffer will favor older mature hardwood species.

C. Promote older forest conditions within filter strips by retaining long-lived species including an increased composition of hemlock.

D. Promote and provide for the placement and future recruitment of large diameter coarse woody debris.

J. Soils

1. Present Condition:

Forests provide a very effective natural buffer that holds soil in place and protects the purity of our water. The trees, understory vegetation, and the organic material on the forest floor reduce the impact of falling rain, and help to insure that soil will not be carried into streams and waterways.

Supporting Map: Figure 13 - Soil Productivity

The soils on the FWC State Forest have been grouped into five physiographic classes, based on the drainage rate of the available moisture. These classes are as follows:

Xeric: Very dry, droughty sites where excessive drainage seriously limits growth and species occurrence. These sites are considered to have low-productivity soils.

The FWC State Forest contains no acreage in this type.

Xeromesic: Moderately dry sites where excessive drainage limits growth and species occurrence to some extent. These sites are considered to have mid-productivity soils.

The FWC State Forest contains 18 acres in this type.

Mesic: Soil-water relationships are favorable to tree growth, with growth and species occurrence limited only by climate. These sites are considered to have high-productivity soils.

The FWC State Forest contains 792 acres in this type.

Hydromesic: Poor drainage or frequent flooding limits species occurrence on these sites. These areas are considered mid-productivity soils.

The FWC State Forest contains no acreage in this type.

Hydric: Growth and species occurrence are severely limited by excess of water. These sites are considered to have low-productivity soils.

The FWC State Forest contains 197 acres in this type.

Studies have indicated that acid rain deposition has an adverse effect on calcium levels in soils. The long term loss of calcium may ultimately adversely affect the growth and sustainability of forests in New England.

2. Desired Condition

The desired condition is a forest where soils are conserved, productive, and managed sustainably. Practices will be designed to keep as much forested land as possible in a productive status, minimize erosion, displacement, compation, and rutting and provide for nutrient recycling. The loss of calcium and other limiting factor nutrients are monitored and, when necessary, mitigation measures are taken to increase these nutrients.

3. Objectives and Management Guidelines

A. Meet MA Forestry Best Management Practices requirements.

B. Maintain soil processes by providing for the recruitment of organic inputs and minimizing erosion.

C. Minimize the number of roads, skid trails, and landings.

D. Require that landings and main skid roads be graded at the end of any operation.

E. Require that all petroleum product, industrial chemicals, and hazardous materials be stored in accordance with manufactures specifications, and at a minimum in durable sealed containers.

F. Prohibit the use of harvesting machinery during the typical mud season (March 15 to May 15) or wet periods unless waived by the forester.

G. Protect highly sensitive or wet soils by limiting activities to period when the ground is frozen or dry to prevent a reduction in site productivity and/or requiring equipment that minimizes impacts to these soils.

H. Manage soils on a sustainable basis. Apply nutrients to soils when they have become a limiting factor to forest growth and sustainability.

K. Special Features

1. Present Condition

A 140 acre tract in the southeast corner of FWC is designated by deed as a wildlife refuge. This area is posted and closed to hunting.

A power line runs through the southwestern section of the FWC, creating 23 acres of early successional habitat that is maintained on a regular basis.

'The Gorge' in FWC State Forest is an interesting land form located south of the camping area. It consists of some steep rock outcrop along a small drainage. A trail runs along the eastern side of the gorge from the campground as it heads off the property to Soapstone Hill, on the DCR, Division of Water Supply Protection land. The rock outcrop provides some unique habitat that does not occur anywhere else on the property.

The UMass Silvicultural Demonstration Research Area will be used to demonstrate the differences in silvicultural treatments and resulting regeneration after high grading, shelterwood, and group selection harvesting.

Supporting Map(s) Figure 14 – Special Features

2. Desired Condition

The desired condition is a forest where special features are recognized, maintained and managed to meet their objectives.

3. Objectives and Management Guidelines

A. Maintain the wildlife refuge by maintain posting and periodically monitoring to enforce the hunting restriction.

B. Maintain the power line right-of-way to meet early successional habitat objectives and transmission line special use provisions.

C. Manage the Gorge to protect its natural and aesthetic values.

D. Cooperate with University of Massachusetts Department of Natural Resources Conservation to establish and maintain research area and share the results of the research with the public as an educational opportunity.

L. Biodiversity: Wildlife, Plants and Rare Species

1. Present Condition

Biological diversity is, in part, a measure of the variety of plants and animals, the communities they form, and the ecological processes (soils, climate, water, nutrient cycling, disturbance etc) that sustain them. With the recognition that each species has value, individually and as part of its natural community, maintaining biodiversity has become an important resource management goal.

A major factor influencing forest biodiversity in Massachusetts is the amount and distribution of forest successional stages. The FWC is composed of approximately 23 acres of early successional habitat, 984 acres of mid successional habitat and 0 acres of late successional habitat.

Rare species include those that are of endangered, threatened, or of special concern as defined in the Massachusetts Endangered Species Act.

Endangered" (E) species are native species which are in danger of extinction throughout all or part of their range, or which are in danger of extirpation from Massachusetts, as documented by biological research and inventory.

"Threatened" (T) species are native species which are likely to become endangered in the foreseeable future, or which are declining or rare as determined by biological research and inventory.

"Special concern" (SC) species are native species which have been documented by biological research or inventory to have suffered a decline that could threaten the species if allowed to continue unchecked, or which occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become threatened within Massachusetts.

The BioMap project, produced by the Natural Heritage and Endangered Species Program, shows areas in Massachusetts where "Core Habitat" exists. This refers to areas where the most viable rare species habitats and natural communities exists. 99% (1001 acres) of the FWC is mapped as BioMap Core Habitat for the species listed below. In addition, 38 percent (382 acres) of the FWC has been identified as being forested in 1830. This relates to the period when Massachusetts was at it's maximum agricultural production. Lands that were forested at this time have potential for having had continuous forest cover since European settlement of North America.

The FWC contains no known occurrences of federally listed threatened or endangered species, or old growth obligate species. There are two known occurrences of state listed rare species. In addition, there are a number of native species that utilize the habitat in the FWC (See Appendix C for a list of species likely to be present in the FWC).

Supporting Map(s) Figure 5 – Age class distribution
Figure 15 – Natural Heritage Priority / Estimated Habitat
Figure 16 – Interior Forest

Number of rare species: 4

Endangered Species:	Spadderdock Darner, *Aeshna mutata*
Special Concern Species:	Four-toed Salamander, *Hemidactylium scutatum*
Watch Listed Species:	Fringed Gentian, *Gentiana crinita*
	Great Blue Heron, *Ardea herodias*

BioMap Core Habitat (BioMap and Living Waters projects) species:

Common Name	Scientific Name	State Status
Marbled Salamander	*Ambystoma opacum*	Threatened
Blue-spotted Salamander	*Ambystoma laterale*	Special Concern
Spotted Turtle	*Clemmys guttata*	Special Concern
Wood Turtle	*Clemmys insculpta*	Special Concern
Spring Salamander	*Gyrinophilus porphyriticus*	Special Concern
Four-Toed Salamander	*Hemidactylium scutatum*	Special Concern
Water Shrew	*Sorex palustris*	Special Concern
Southern Bog Lemming	*Synaptomys cooperi*	Special Concern
Eastern Box Turtle	*Terrapene Carolina*	Special Concern

Acres of Estimated/Priority Habitat: 118.5

Acres of Interior Forest Habitat:

High Quality (more that 600 ft from non-forest land use): 744 acres (74% of total)
Mid Quality (more than 300 ft from non-forest land use): 885 acres (88%)

2. Desired Condition

The desired condition is a forest where biodiversity is provided through the protection of rare species and the maintenance of habitats. All vegetative successional stages are represented. Biodiversity is further provided through a planned range of species composition and structural components and a well functioning forest ecosystem.

3. Management Objectives and Guidelines

A. Rare Species

1. Consult with Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas for known occurrences or habitats of rare species during project planning.

2. Survey for rare species and habitats during all field operations. Training and protocols will be developed by biologist/ecologist.

3. Submit NHESP for review and recommendations the silvicultural prescription or project report with species and habitat considerations when rare species and/or their habitats are located.

4. Incorporate mutually agreed upon NHESP recommendations for the protection of rare species and their habitats into project prescriptions to:
    a. Meet the legal requirements regarding the protection of rare species.

b. Contribute towards providing habitat to sustain minimal viable populations of rare species.
c. Provide the following measures for Great Blue Heron:
   - Provide standing dead trees over water such as beaver ponds for the establishment of colonial nesting rookeries.
   - Restrict harvesting operations within 4/10 of a mile of an active nest during the breeding season (Late February through August).

B. Biodiversity:

1. Balance age classes (See Appendix H, Figure 07A – Age Class Distribution).

2. Provide a diversity of native species composition including herbs, forbs, and woody vegetation.

3. Provide a diversity of horizontal and vertical forest structures.

4. Maintain healthy and regenerative forest function.

L. Fire

1. Present Condition

Most forests including FWC in Massachusetts are relatively resistant to catastrophic fire. Historically, Native Americans commonly burned certain forests to improve early successional habitat for hunting. In modern times, fires most often result from careless human actions.

Although not a prime influence in these forests, the risk of unintentional and damaging forest fires can increase as a result of logging activity if the slash (tree tops, branches, and debris) is not treated correctly. Adherence to the Massachusetts slash law minimizes this risk. Under the law, slash is to be removed from buffer areas near roads, boundaries, and critical areas and lopped close to the ground to speed decay. Well-maintained woods roads are always desirable to provide access should a fire occur.

Depending on the fuel types, fire risk and habitat goals for the area, fire can also be considered as a management tool to favor certain species of plants such as oak, provide habitat for wildlife such as ruffed grouse or reduce the risks of hazardous fuels.

Fire Risk and Occurrence:	Low
Man-made Water Holes:	8
Responsible state fire district:	8

Distance to nearest responding town fire station:	4.3 miles
Fire towers on property:	0
Fires in previous 15 years:	0
Acres burned in previous 15 years:	0

2. Desired Condition

The desired condition is a forest with a low threat of catastrophic fire, and with the infrastructure to allow efficient response to wildfire and for the application of prescribed fire.

3. Management Objectives and Guidelines

A. Inventory and maintain desirable fire roads and water drafting sites.

1. Minimize road width to only what is necessary.

2. Encourage canopy cover over road.

3. Minimize clearing width for safe passage and provide minimal necessary fire breaks.

4. Minimize conflicts between rare species and wildlife dispersal capacity.

5. Minimize adverse migratory effects on wildlife through properly designed and maintained roads and structures (cut and fill banks, culverts, ditches)

B. Meet with District Fire Warden to review and address fire concerns.

C. Meet MA Forestry Best Management Practices requirements for slash.

D. Suppress wildfires to meet the following objectives:

1. Provide for the safety and well being of fire fighters and the public.

2. Protect natural resource investments and private property.

3. Use light hand on the land tactics.

4. Coordinate suppression tactics with the natural resource desired conditions.

5. Extinguish wildfires in an aggressive manner.

E. Use prescribed fire to maintain natural communities; reduce the buildup of hazardous fuels; enhance conditions favorable to rare species or communities; establish oak and white pine regeneration; and create habitat for early successional species.

M. Forest Products

1. Present Condition

The Bureau of Forestry fulfills its mission of providing income from the sale of forest products through the use silvicultural practices designed to balance ecological, social and economic considerations. The enabling legislation that created the Bureau of Forestry states that the State Forests shall be "in perpetuity income producing". This same legislation goes on to say that the Bureau shall manage to "improve" these same forests. It is this balance that is at the heart of the Bureau's mandate and its social responsibility. More specifically Massachusetts General Law Chapter 132 defines the mission of the Bureau. The Commonwealth's Bureau of Forestry exists to protect the publics' interest in the both the private and public forest lands of Massachusetts. These public interests include: water conservation, flood and soil loss prevention, wildlife habitat, recreation, protection of water and air quality, and a continued and increasing supply of forest products. The Bureau provides for forest products in an ecologically and socially responsible and environmentally sensitive manner.

The Bureau meets its responsibility by focusing on desired conditions for all resources. A desired condition is simply a statement describing the desired biological, physical and/or social condition or context. If the desired condition will not be achieved by letting the stand in its present condition proceed on its current successional course, the Bureau then considers the option of using silviculture to modify either the direction or the time frame.

The Bureau fulfills its mission to provide forest products by designing silvicultural operations in which timber products are offered for sale to private contractors. Not only does this provide direct income to the Commonwealth, but the "value added" results of processing these products benefits many sectors of the Massachusetts economy. Generally speaking, the higher the quality of the forest products offered the greater will be the value added benefits. All harvesting is done in a manner that meets biodiversity needs, is socially responsible, and can occur in a long-term sustained manner. The FWC is part of the state lands system that have been "green certified" as sustainable forest management (2004) based on Forest Stewardship Council principles by an independent audit team - Scientific Certification Systems.

Supporting Map(s) Figure 17 – Forest Products Harvesting – 1988-2003

Total Acres:	1007
General Natural Resource Management Acres:	685

Number of Forest Products Sales 1988-2003:	3
Total Acres Treated 1988-2003:	71
Acres treated to release existing regeneration:	0
Acres treated to establish regeneration:	30
Acres treated with intermediate harvests:	40
Acres treated for other objective:	0
Volume harvested 1988-2003:	1,200 tons of biomass
	285 cords firewood
	124 mbf sawtimber

2. Desired Condition

The desired condition is a forest that supplies a sustainable flow of high quality forest products while meeting ecological and social goals and objectives.

3. Expected Timber Products Outputs:

A. First Planning-Treatment Cycle (By 2018):

Treatments	**Acres**	**MBF**	**Cords**
Upland Opening	16	97	208
Final Removal of Overstory	86	538	1126
Shelterwood	77	220	820
Thinning	122	97	485
Total	301	952	2639

Volumes calculated from SILVAH inventory data.

Final removal of overstory assumes 90% of sawlog volume and 100% of cordwood removed.

Shelterwood assumes 33% of sawlog volume and 70% of cordwood removed.

Thinning assumes 15% of sawlog volume and 25% of cordwood removed.

Approximate present value of forest products based on most recent quarterly stumpage report (3^{rd} quarter 2003): $125,000

B. Succeeding Planning-Treatment Cycles (each 15 year period beyond 2018):

Treatments	**Acres**	**MBF**	**Cords**

Final Removal of Overstory	85	532	1113
Shelterwood	85	243	905
Thinning	100	80	398
Total	270	855	2416

The approximate present value of forest products based on most recent quarterly stumpage report is (3rd quarter 2003): $114,000.

N. Inventory, Monitoring, and Evaluation:

The Bureau of Forestry is committed to the principles of adaptive management. Adaptive management uses the best information available to make decisions in a manner in which the state forest's natural resources are to be managed, monitors the results for effectiveness, uses new information as it becomes available, evaluates the results of monitoring and new information, and updates through incremental improvements the manner in which state forests are managed. The following is a summary of adaptive management procedures for FWC.

A. Project Level

1. Inventory:
    a. Initiate projects with a general walk through of areas most likely to meet objectives (see Appendix C – Management Practices)
    b. Collect data on selected stands when needed to quantify stocking level, species composition, and quality of overstory and regeneration to include in silvicultural prescriptions.
    c. Cultural Resources
    d. Rare landforms, habitats, and species
    e. Invasive species

2. Monitoring:

    a. During treatment monitor for:
        i. Best Management Practices compliance
        ii. Road Condition
        iii. Natural Heritage Requirements
        iv. Cultural Resource Protection
        v. Silvicultural Prescription
        vi. Forest Product Accountability

vii. Other Contractual Requirements

b. Post Treatment (approximately 5 years after treatment) for:
   i. Forest health
   ii. Regeneration success and composition
   iii. Best Management Practices
   iv. Invasive species
   v. Unauthorized ORV, reserves
   vi. Road and boundary conditions

3. Evaluate:
   a. Contractor performance
   b. Bureau personnel performance
   c. Fulfillment of forest plan and silvicultural objectives
   d. Effectiveness of the treatment

B. Forest Level

1. Inventory (By 2018 and every 15 year planning cycle):
   a. Re-measure Bureau's Continuous Forest Inventory plots
   b. Road conditions
   c. Boundary Condition

2. Monitor (By 2018 and every 15 year planning cycle):
   a. Forest health
   b. Biodiversity
   c. Regeneration
   d. Best Management Practices
   e. Invasive species
   f. Unauthorized ORV, reserves
   g. Road and boundary conditions
   h. Reserves
   i. New Information
   j. New Public Issues
   k. Unauthorized digging collecting around historic archaeological sites and features
   l. Soil productivity including the loss of nutrients such as calcium

3. General Program Management Review (at District level every 4 years)
   a. Plan implementation
   b. Monitoring and Evaluation Efforts
   c. Currency of forest plan
   d. Public Involvement
   e. Relationships with others

4. Evaluation: Information will be evaluated against the desired condition of the Forest Plan to determine the effectiveness of the Forest Plan and the need to update it. A report will be prepared summarizing the results. This report will consider if:
    a. Additional treatments are needed to meet the desired conditions
    b. Desired conditions need to be modified because of survey, inventory, or new information
    c. Existing management objectives and guidelines are effective and complete
    d. Any new information, research or new issues need to be considered.

O. Public Involvement:

The State Forests and Parks are public resources and management must be responsive to societal needs while using the best available science and maintaining options for future generations. Public involvement is critical to resource management planning and implementation. Public involvement is an ongoing process that consists of gathering input, analyzing, evaluating and responding to input, and sharing information. The Bureau will be responsible to stakeholders through the public involvement process, implementation, and evaluation and reporting.

A. Project Level

1. Meet all regulations for review of projects. This will include review of all projects by conservation commission, select boards.

2. Consider public comments and responses (Appendix E) as they relate to project level prescriptions.

B. Property Level

Ecoregional meeting held: 09/24/2003
Number attending: 17
Site Plan meeting held: 10/15/2003
Number attending: 23

1. Notify the public if there is a need to update the FWC plan. The public will be notified when an update is necessary. The notice will include specific Forest Plan proposed changes with rationale.

2. Develop and publish for review a FWC Stakeholders Report within 10 years from the approval of the FWC plan to track implementation efforts and share the results of monitoring and evaluation.

Appendix A – Stand Details

Description overview: To facilitate management and communication, large forested areas are broken up into smaller areas of similar conditions called cover types and stands. A cover type is a broad description based on the dominate overstory species. A stand is a smaller grouping of vegetation sufficiently uniform in species composition, age, and condition to be distinguished from surrounding vegetation types and managed as a single unit. In this section the existing condition of each forest stand will be described under the broader cover type headings. Stand descriptions are found in table form. For explanation of the various fields see the end of this Appendix.

A. White Pine Cover Type

The white pine type describes areas where eastern white pine exists in pure stands or is predominant. It is usually found on sandy or well drained soils. In the FWC State Forest area this type occurs naturally and as planted stands. The planted stands are a result of CCC efforts in the 1930s. The white pine cover type is self sustaining on sandy soils. Many species of wildlife use this type as a food source (pine seeds) and for nesting and thermal cover. White pine is a good producer of structural lumber and is used for flooring, door and windows and furniture. This type is often found on abandoned pastures and agricultural lands.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	05	WP	4	2	3	6	62	115	7.1	16.8	188	30%	70%	0
1	12	WP	4	2	3	5	62	75	8.2	14.6	176	43%	57%	0
1	15	WP	4	2	5	3	65	70	10.2	14.4	141	46%	54%	9
1	28	WP	4	2	3	3	62	80	19.5	15.9	159	40%	60%	0
2	02	WP	4	3	3	7	61	74	13.8	12.7	118	34%	66%	9
2	13	WP	4	2	3	7	66	60	15.8	13.1	168	49%	51%	0
2	16	WP	4	2	3	1	70	70	20.3	12.6	154	43%	57%	8
2	30	WP	4	3	3	3	58	75	10.1	13.4	128	33%	67%	0

B. White Pine / Hardwoods Cover Type

The white pine /hardwoods cover type is a mix of eastern white pine, oaks, maples, birches, and or hickory. This is often a transition type and management can be used to convert these areas to a white pine dominated type or favor hardwoods. The diversity of this type is very desirable for wildlife habitat. The mix of hardwoods and pines can provide several sources of food for foraging birds and mammal and the structural diversity is also desirable for breeding and resting cover. Recreational values are high due to the same diversity. This type is also desirable for wood production and the diversity of species allows for mixed product harvest and allows for a range of appropriate sivicultural methods.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	10	WH	4	2	5	6	63	73	12.1	13.6	120	38%	62%	0
1	11	WH	4	2	3	1	62	75	30.6	13	160	42%	58%	0
1	14	WH	4	2	3	2	68	80	30.2	13.3	155	40%	60%	0
1	16	WH	4	2	5	5	69	65	14.7	13.3	141	38%	62%	0
1	20	WH	4	1	3	5	65	67	11.5	14	175	49%	51%	0
1	21	WH	3	2	3	3	66	85	13.0	11.7	148	40%	60%	0
1	27	WH	4	2	3	2	62	75	11.1	14.7	133	65%	35%	0
1	30	WH	4	3	3	3	59	75	17.3	13.4	108	47%	53%	9
2	06	WH	4	2	3	1	58	77	18.0	11.6	151	34%	66%	0
2	09	WH	4	2	5	1	64	78	9.8	11.2	167	53%	47%	0
2	15	WH	4	2	3	1	59	76	12.8	11.5	148	49%	51%	0
2	19	WH	4	2	5	3	65	70	23.6	12.8	137	57%	43%	0
2	20	WH	4	2	5	3	66	60	7.1	12.3	155	49%	51%	0
2	21	WH	4	2	3	3	63	67	18.6	12.8	138	34%	66%	0
2	23	WH	4	2	3	3	72	57	15.1	13	128	41%	59%	0
2	28	WH	4	2	3	3	65	80	6.7	11.8	146	40%	60%	0

C. White Pine / Hemlock Cover Type

This type consists of eastern white pine, eastern hemlock and a large assortment of associated hardwood species. This type is often found on more moist and cool north and northwestern aspects and in valleys and ravines. This type has high value for wildlife thermal cover and nesting habitat for interior forest bird species. Its wood production values very depending on the site and access. Recreational value can be high for the solace and "deep" forest feel that these types can provide.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	02	WK	4	2	3	5	62	85	24.9	14	173	49%	51%	0
1	03	WK	4	2	3	6	54	70	13.0	14.1	165	38%	62%	0
1	08	WK	4	2	3	3	58	75	19.8	14.5	165	30%	70%	0
1	09	WK	4	2	5	6	62	65	5.6	14.3	190	27%	73%	0
1	13	WK	4	2	3	5	68	90	34.7	13.7	141	59%	41%	0
1	17	WK	4	2	5	4	70	65	24.4	15.1	150	31%	69%	0
1	19	WK	4	2	3	3	67	75	23.3	14	189	47%	53%	0
2	29	WK	4	2	3	3	60	70	15.5	12.4	207	23%	77%	0

D. White Pine / Oak Cover Type

The white pine / oak cover type occurs where eastern white pine and northern red or black oak predominate. Mixed hardwoods may be found in association with this type. This type is very desirable for many forest values. Wildlife species benefit from the mix of cover and food that the oaks and pine provide. This type provides good foraging opportunities for deer, bear, turkey, and many smaller songbirds and mammals. Timber production possibilities are good as the pine can produce high volumes per acre while the oaks can greatly increase the value per acre. This allows for a variety of management techniques and improvement work. The mix of species also provides good recreation and watershed values.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	24	WO	4	2	3	1	65	68	22.9	14.8	156	54%	0%	9
1	25	WO	4	2	3	3	66	78	5.3	15.1	118	48%	52%	0
1	26	WO	4	2	3	3	62	90	12.8	13.9	138	41%	59%	0
1	29	WO	4	2	3	2	64	75	7.8	12.2	146	52%	48%	2
2	03	WO	4	2	3	3	59	70	16.0	12.1	127	44%	56%	0
2	22	WO	4	2	3	3	61	68	19.4	12.3	129	47%	53%	0
2	24	WO	4	2	3	1	64	80	20.6	12.8	132	45%	55%	2
2	26	WO	4	2	1	3	58	75	15.5	11.7	131	49%	51%	0

E. Hemlock Cover Type

Eastern hemlock is pure or predominate over associated hardwoods in this type. This type can be found throughout Massachusetts but is more prevalent in the western part of the state. It is uncommon as a pure stand but is often the result of cutting pine in a previous white pine / hemlock type. Pure stand of hemlock are important as winter deer yards. In severe weather the deer congregate in these areas due to the fact that snow cover under the thick hemlocks is often reduced. These stands have low forest product values, but medium to high recreational value. These stands are threatened by the spread of hemlock wooly adelgid, and pure stand could be totally lost due to feeding by this insect.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	01	HK	4	2	5	6	58	65	10.7	13.1	165	41%	59%	0
1	04	HK	4	2	3	5	62	67	10.4	13.9	189	48%	52%	0
1	06	HK	3	2	3	6	35	85	5.4	10	166	42%	58%	0
1	07	HK	3	2	3	6	59	65	9.5	11.2	190	47%	53%	0
2	01	HK	4	2	3	6	52	75	19.2	13.2	176	40%	60%	0
2	10	HK	4	2	3	6	54	85	9.7	13	223	57%	43%	0

F. Hemlock / Hardwoods Cover Type

Much more common then the pure hemlock cover type is the areas where hemlock and yellow birch dominate with a mixture of sugar maple, beech, and red oak associates. This type is found on moist sites and can be associated with riparian areas or forested wetlands. Its diversity both in terms of species and vertical structure make it desirable for interior forest wildlife birds and mammals. The timber value of these types varies depending on the type and amount of hardwood species present. These types have high recreational and watershed values.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
2	05	HH	4	2	3	7	46	72	13.5	12.8	142	39%	61%	0
2	07	HH	4	1	3	3	47	95	10.8	12.3	184	37%	63%	0

G. Northern Red Oak Cover Type

Northern red oak predominates in this type with smaller amount of other hardwoods. This type have very high wildlife and timber values. Northern red oak is second only to sugar maple in the northeast when it comes to producing high value wood products. Especially valuable are trees capable of producing veneer quality wood. Red oak acorns provide food for many species of wildlife including deer, turkey, beer, many birds, mice and other small mammals. Larger trees can provide roosting and nesting sites as well as long lasting cavities for birds and mammals. Pure northern red oak stand are rare and high value stand are found on rich sites were they often trend towards mixed oak or oak hardwood types.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	22	OR	4	1	3	2	61	71	39.9	12.1	118	61%	39%	0

H. Mixed Oak Cover Type

The mixed oak cover type contains a mixture of red, white, black, and scarlet oak. The type may also contain hickories and other hardwoods, but the oaks will predominate. This type is important for many wildlife species that feed on acorns such as deer and turkey. The mixed oak cover type is a climax type and will regenerate itself. It found on a variety of soil types but is maintained on poorer or rocky soils. The mixed oak type supports a variety of understory species including young tree oaks, scrub oak, blueberries, huckleberries, ferns and other forbs. The type can be an important source of fuelwood, but the common occurrence poorly formed trees prevent this type from producing substantial commercial timber in southeastern Massachusetts. The mixed oak types are important for recreation and provide fall color. Many trails are found in these types and this cover type is also used by birders and hunters as they pursue the species that make there homes in and under the oaks and hardwoods.

Comp #	Stand #	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Pos'n	Site Index	Stand Age	Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	18	OM	4	1	3	3	57	65	25.5	12.1	146	40%	60%	0
1	23	OM	4	2	3	3	60	65	23.2	12	104	64%	36%	0
2	04	OM	4	1	3	3	58	83	33.1	12.4	111	40%	60%	0
2	08	OM	4	1	3	2	50	64	9.0	11.6	119	46%	54%	0
2	11	OM	4	1	3	7	59	95	6.3	12.7	127	63%	37%	0
2	12	OM	4	1	3	1	61	68	17.3	11.3	114	39%	61%	0
2	14	OM	4	1	3	2	64	90	5.1	12.8	129	50%	50%	2
2	25	OM	3	2	1	5	55	68	4.4	11.5	85	49%	51%	0
2	27	OM	3	2	3	5	62	75	27.0	10.9	104	74%	26%	0
2	31	OM	4	1	3	2	68	58	10.5	11.8	123	66%	34%	0

I. Shallow Marsh and Deep Marsh Cover Types

The shallow marsh type is completely water logged soils and is often covered by water during part or all of the growing season. The dominant vegetation is emergent wetland plants such as cattails, bulrushes, burreed, phragmites, grasses, and sedges.
Water depths in the deep marsh type ranges from six inches to three feet. Fairly large open water areas are bordered by or interspersed with emergent vegetation found in the shallow marsh types. Floating and submergent plants such as water lilies, duckweed, watershield, and pondweeds are also present.

These types serve as breeding and feeding habitat to reptiles, amphibians, and birds. Deeper areas support fish populations. Many terrestrial animals also come to these areas to drink and feed. They have high recreational value but are sensitive to overuse. They have no timber value. Also included below is the open water and cliff area around an abandoned sand and gravel pit. Again this area has high recreational, scenic, and wildlife values.

Comp #	Stand Number	Overstory Type	Size Class	Stocking Class	Soil Class	Terrain Position	Site Index	Stand Age	Total Acres	Mean Stand Diam.	Basal Area	% AGS	% UGS	Disturbance
1	32	MD	0	0	5	8	0	0	12.2	0	0	0	0	0
2	33	MD	0	0	5	8	0	0	5.0	0	0	0	0	0
1	31	MS	0	0	5	8	0	0	15.0	0	0	0	0	0
2	32	MS	0	0	5	8	0	0	7.2	0	0	0	0	0
2	35	MS	0	0	5	8	0	0	12.3	0	0	0	0	0

Explanation of Fields:

COMPARTMENT NUMBER

The administrative compartment number, this number should be taken off of the forest map.

STAND NUMBER

The stand number, this number should be taken off of the forest map.

OVERSTORY TYPE

A two letter code that best describes the dominant overstory.

SIZE CLASS

0 Non-stocked: Areas that have less than 10% stocking.

1 Seedling: Areas with greater than 10% stocking where the stand dominating the site is over 3' in height, and less than 1.0" DBH.

2 Sapling: Areas with greater than 10% stocking where more than half of the stocking of the stand dominating the site is between 1.0" DBH and 5.0" DBH.

3 Pole: Areas with greater than 10% stocking where 50% or more of the stands basal are is in stems 5.0" DBH to 10.9" DBH.

4 Sawtimber: Areas with greater than 10% stocking where 50% or more of the stand basal area is greater than 11.0" DBH.

9 Uneven-aged or mosaic: See stand structure. Areas with greater than 10% stocking where there is no definite size class.

STOCKING

For seedlings, sapling, and ground cover or other, the stocking represents th percent of area covered.

Code	From Stocking Guides	Percent of Area Covered
0	Non-Forest, No Stocking,	<10%
1 (high)	A - or more; or 120 sq. ft. B.A./Acre+	80%+
2 (med)	B - A or 60 - 120 sq ft. B.A./Acre	60%-80%
3 (low)	C - B or 40 - 60 sq. ft. B.A./Acre	40% - 60%
4 (sparse)	less than 40 sq. ft. B. A./Acre	< 40%

SOIL CLASS

A physiographic class based upon the following specific soil and water conditions that determine forest type and site.

1 Xeric Sites; Very dry, droughty sites where excessive drainage seriously limits growth and species occurrence. Examples are the sand hills of the southeastern pine forest, the thin soiled ridge tops of the appalachian, and the jack pine plains of the northeastern coniferous forests.

2 Xeromesic Sites; Moderately dry sites where excessive drainage limits growth and species occurrence to some extent. These include the flat woods in southeastern forests, the drier oak ridges in the Ozard-piedmont forests, and the red pine – jack pine associations on the sandy and gravelly sols in the northeastern coniferous forests.

3 Mesic Sites; Soil-water relationships are favorable to tree growth, with growth and species occurrence limited only by climate. These are the deep, well drained soils, usually well suited to agriculture, in all regions. These sites offer the most favorable management opportunities.

4 Hydromesic Sites; Poor drainage or frequent flooding limits species occurrence on these sites. These include the better drained bottom land hardwood sites; the heavy, poorly drained, truncated soils of the Ozark-piedomont forest; and the hardpan sois of the northeastern coniferous forests.

5 Hydric Sites; Growth and species occurrence are severely limited by excess of water. These are pocosins, swamps, and bays of the southeastern pine forests; wet, frequently flooded river bottoms; and spruce bogs of the northeastern coniferous forests.

TERRAIN POSITION

This item relates to the stands location on a landform.

1 Top of slope; convex region.
2 Upper slope; convex region at upper edge of slope.
3 Mid-slope; uniform, fairly straight region.
4 Bench; area of level land with slopes above and below.
5 Lower slope; concave region at the lower edge of slope.
6 Bottomland; horizontal region in low-lying areas, may be subject to occasional flooding.
7 Flatland; regions not part of or related to slopes; may have minimal elevation changes - less than 5% slope.
8 Wetland areas

SITE INDEX

The inherent productive capacity of a specific location (site) in the forest affected by available growth factors (light, heat, water, nutrients, anchorage); expressed as tree height at 50 years of age.

STAND AGE

Breast height age is used because that is where most increment core borings are made. A constant age to breast height is used in some cases to produce total age.

ACRES

The number of acres that the stand covers to the nearest whole number.

MEAN STAND DIAMETER

The average diameter of trees of merchantable size (5.0 inches DBH or greater)

BASAL AREA

The average basal area in square feet for the stand.

% AGS

The percent of basal area per acre in acceptable growing stock

% UGS

The percent of basal area per acre in unacceptable growing stock

DISTURBANCE

Record the disturbance agent that has been most influential in affecting the development of the vegetation in the vicinity of the plot.

0 None
1 Fire
2 Wind
3 Snow & Ice (’21, ’42, ’58, ’96 - ’97)
4 Other use, cleared
5 Other use, pastured
6 Insects
7 Disease
8 Timber stand improvement
9 Harvest cut

Appendix B – Management Practices

Management Practice 1 – Release Existing Regeneration

Practice Purpose:
Release exisiting desirable regeneration on approximately 12.5% of the manageable acres of FWC State Forest by 2018
Characteristics of stands most likely to meet objectives:
Stands with adequaete amounts of desirable regeneration in the understory on productive soils
Desired conditon of stands 15 years after practice is applied:
Regeneration is fully released and free to grow
Appropriate Silvicultural Treatments:
Shelterwood Removal Cut (with retention)
Group Selection
Individual Tree Selection
Trees to be removed or retained:
Trees to be removed are those necessary to release regeneration. Overstory trees will be retained individually or in groups to meet legacy, cavity, and diverstity goals.
Special conderations: In areas where regeneration is inadequate seed trees of desirable species will be retained until regeneration is established.

Regeneration Release Harvesting Priorities

The following chart shows the potential stands chosen for release harvesting, and the criteria that each stand meets for this management practice. Stands were considered for their current level of acceptable regeneration, site productivity, potential to minimize edge effect in the forest, and potential for aggregation with adjacent stands. Stands that meet a criterion have an "X" in the corresponding box.

Comp/ Stand	Regeneration	Soil Productivity	Edge/Adjacent	Aggregation	Priority	Total Acres	Manageable Acres
1/14	☐	☒	☐	☐	Low	30.2	29.4
1/18	☐	☒	☒	☐	Med	25.5	21.7
1/20	☐	☒	☐	☐	Low	11.5	11.1
1/21	☐	☐	☒	☒	Low	13.0	12.5
1/22	☒	☒	☐	☐	Med	39.9	35.0
1/23	☐	☒	☐	☐	Low	23.2	21.9
1/24	☐	☒	☐	☐	Low	22.9	19.6
1/25	☐	☒	☒	☒	Med	5.3	4.9
1/26	☒	☒	☒	☒	High	12.8	12.3
1/27	☐	☒	☒	☒	High	11.1	10.1
1/28	☒	☒	☒	☒	High	19.5	18.3
1/29	☐	☐	☒	☒	Low	7.8	7.8
2/16	☒	☒	☒	☐	High	20.3	15.4
2/20	☐	☒	☒	☐	Med	7.1	5.2
2/21	☒	☒	☒	☒	High	18.6	16.1
2/22	☐	☒	☐	☐	Low	19.4	16.7
2/23	☐	☒	☒	☒	High	15.1	13.6
2/26	☐	☒	☐	☐	Low	15.5	13.9
2/27	☐	☒	☐	☐	Low	27.0	24.6

Criteria for selection:

Regeneration – Stands with over 300 stems per acre over 4.5 feet in height.

Site Index – Stands considered with high productivity (mesic) soils.

Edge Adjacent – Stands adjacent to high priority stands that will not create excessive amounts of habitat edge through creation of an early seral stage.

Aggregation – Stands with the potential to be aggregated with adjacent stands through this management practice.

Management Practice 2 – Establish Regeneration

Practice Purpose:
Establish desirable regeneration on approximately 12.5% of the manageable acres of FWC State Forest by 2018
Characteristics of stands most likely to meet objectives:
High risk stands
Stands where overstory species is ill suited to site
Stands on productive soils
Desired conditon of stands 15 years after practice is applied:
Adequate desirable regeneration is established and ready for release
Appropriate Silvicultural Treatments:
Shelterwood Prep Cut
Shelterwood Seed Cut
Patch Cut
Group Selection
Individual Tree Selection
Trees to be removed or retained:
Trees to be removed are those necessary to create conditions favorable to the establishment of desirable regeneration. Removals will be concentrated on undesirable growing stock. Retention trees will be preferred and acceptable growing stock and/or seed trees of species appropriate to the site conditions.
Special conderations: In areas where inadequate seed trees of desirable species exist, artificial regeneration may need to be considered.

Regeneration Establishment Harvesting Priorities

The following chart shows the potential stands chosen for regeneration establishment harvesting, and the criteria that each stand meets for this management practice. Stands were considered for their current condition, amount of unacceptable growing stock, site productivity, location with respect to other harvesting management practices, and potential for aggregation with adjacent stands. Stands that meet a criterion have an "X" in the corresponding box.

Comp/ Stand	High Risk	< 35% AGS	Mature	Soil Productivity	Adjacent	Aggregation	Priority	Total Acres	Manageable Acres
1/01	☒	☐	☐	☐	☐	☐	Med	10.7	8.7
1/02	☐	☐	☒	☐	☐	☐	Low	24.9	24.9
1/19	☒	☐	☐	☒	☐	☐	High	23.3	21.7
1/20	☐	☐	☐	☒	☒	☒	Med	11.5	11.1
1/22	☐	☐	☐	☒	☒	☐	Low	39.9	35.0
1/24	☐	☐	☐	☒	☒	☐	Low	22.9	19.6
1/25	☐	☐	☒	☒	☒	☒	High	5.3	4.9
2/02	☐	☒	☐	☒	☒	☒	High	13.8	13.8
2/05	☒	☐	☐	☒	☐	☐	Med	13.5	12.5
2/06	☐	☒	☐	☒	☒	☒	High	18.0	17.6
2/20	☐	☐	☐	☒	☒	☐	Low	7.1	5.2
2/22	☐	☐	☐	☒	☒	☒	Med	19.4	16.7
2/26	☐	☐	☐	☒	☐	☐	Low	15.5	13.9
2/27	☐	☐	☐	☒	☐	☐	Low	27.0	24.6
2/29	☒	☒	☐	☐	☒	☒	High	15.5	9.8
2/30	☒	☐	☐	☐	☒	☒	High	10.1	8.7

Criteria for selection:

High Risk – Stands given a condition of high risk due to the expectation that the stand will not survive the next ten years, or will experience a net volume loss.

< 35% AGS – Stands with less than 35 percent of the stocking in acceptable growing stock.

Mature – Stands that have been designated with a stand condition of mature.

Soil Productivity – Stands considered with high productivity (mesic) soils.

Adjacent – Stands adjacent to other regeneration harvesting activities scheduled for this planning cycle that would make sale administration easier.

Aggregation – Stands with the potential to be aggregated with adjacent stands through this management practice.

Management Practice 3 – Intermediate Treatments

Practice Purpose:
To improve the health, vigor, and quality of stands and individual trees on at least 15% of the manageable acres of FWC State Forest by 2018.
Characteristics of stands most likely to meet objectives:
Overstocked stands on productive soils
Stands adjacent to stands to be regenerated or released
Desired conditon of stands 15 years after practice is applied:
Improved spacing of trees with a marked imrovement in the ration of acceptable to unacceptable growing stock
Appropriate Silvicultural Treatments:
Precommercial Thinning
Commercial Thinning
Trees to be removed or retained:
Trees to be removed are those necessary to achieve spacing and stocking goals. Removals will be concentrated on unacceptable trees or species that are ill suited to the site.
Special conderations:
Although the overall goal is improving spacing and quality these treatments should be irregular to leave a range of genetic and structure characteristics.

Intermediate Harvesting Priorities

The following chart shows the potential stands chosen for intermediate harvesting, and the criteria that each stand meets for this management practice. Stands were considered for their site productivity, stocking level, location with respect to other harvesting management practices, and potential for aggregation with adjacent stands. Stands that meet a criterion have an "X" in the corresponding box.

Comp/ Stand	Soil Productivity	Overstocked	Adjacent	Aggregation	Priority	Total Acres	Manageable Acres
1/14	☒	☐	☐	☐	Low	30.2	29.4
1/15	☒	☐	☒	☐	Med	10.2	9.7
1/18	☒	☒	☐	☒	High	25.5	21.7
1/20	☒	☐	☒	☐	Med	11.5	11.1
1/22	☒	☒	☐	☒	High	39.9	35.0
1/23	☒	☐	☐	☒	Med	23.2	21.9
1/24	☒	☐	☒	☐	Med	22.9	19.6
1/30	☒	☐	☐	☐	Low	17.3	16.9
2/04	☒	☒	☐	☐	Med	33.1	33.1
2/05	☒	☐	☐	☐	Low	13.5	12.5
2/08	☐	☒	☒	☐	Med	9.0	8.2
2/09	☒	☐	☐	☐	Low	9.8	7.9
2/11	☒	☒	☐	☐	Med	6.3	6.3
2/12	☒	☒	☐	☐	Med	17.3	13.9
2/14	☒	☒	☐	☐	Med	5.1	5.1
2/20	☒	☐	☐	☐	Low	7.1	5.2
2/22	☒	☐	☒	☒	High	19.4	16.7
2/24	☒	☐	☐	☐	Low	20.6	16.0
2/26	☒	☐	☒	☒	High	15.5	13.9
2/27	☒	☐	☒	☒	High	27.0	24.6
2/28	☒	☐	☐	☐	Low	6.7	6.6
2/31	☒	☒	☒	☒	High	10.5	10.5

Criteria for selection:

Soil Productivity– Stands considered with high productivity (mesic) soils.

Overstocked – Stands above the "A" level of stocking for their forest type.

Adjacent – Stands adjacent to other harvesting activities scheduled for this planning cycle that would make sale administration easier.

Aggregation – Stands with the potential to be aggregated with adjacent stands through this management practice.

Management Practice 4 – Establish Permanent Early Successional Habitat

Practice Purpose: Establish 16 acres of permanent early successional habitat to enhance the habitat value of the existing powerline
Characteristics of stands most likely to meet objectives:
Stands adjacent to existing powerline where soils can support grass, forb and shrub species
Desired conditon of stands 15 years after practice is applied:
An effective 16 acre block of early successional habitat that complements the existing habitat along the powerline.
Appropriate Silvicultural Treatments:
Patch Cut
Clear Cut
Trees to be removed or retained:
Trees to be removed are those necessary to establish early succesional characteristics. Overstory trees will be retained individually or in groups to meet habitat goals.
Special conderations:
Maintenece of this type will require periodic treatments.

Management Practice 5 – Establish Intentional Reserves

Practice Purpose:
Protect unique areas of high environmental and social value by creating intentional reserves on approximately 20% of the FWC State Forest by 2018
Characteristics of areas most likely to meet objectives:
Wetlands
Cultural Features
Special Features
Areas with steep slopes
Old growth areas
Desired conditon of stands 15 years after practice is applied:
Areas where natural processes are occuring with little or no man-made disturbance
Appropriate Silvicultural Treatments:
None
Special conderations: Although values change these areas should be protected for periods longer than that covered by this plan

Management Practice 6 – Road Maintenance and Closure

Practice Purpose:
Repair approximately 2 miles of roads in the FWC State Forest by 2018 to protect soil and water quality and improve access.
Characteristics of roads most likely to meet objectives:
Roads with active erosion

Roads with poor or inadequate drainage
Poorly designed or maintained roads
Desired conditon of roads after practice is applied:
Stable roads capable of withstanding normal and storm runoff with little or no erosion
Appropriate Treatments:
Crowning
Ditching
Repairing/Installing culverts
Drainage Dips
Water Bars
Resurfacing
Gating
Seeding
Signage
Special conderations: Every effort should be made to minimize permanent roads while allowing adequete access for mangagment and recreation.

State Forest Road Classification and Maintenance Standards

A three character code is used to describe the Road Class for each road in the State Forest system – both its present condition and what its future state should be. The code is expressed as a fraction, with the numerator representing the proposed class and the denominator its present class (proposed/present). The first character indicates the Type, the second describes the Maintenance Level, and the third character shows the type of Traffic Management for the road. The three character codes are described below:

Type:

1. Paved, asphalt, stone and oil, etc., 2 lane 40 mph.
2. Processed gravel or crushed stone surface, 2 lane, 20’ wide, 25 mph.
3. Bank run gravel surface, single lane, 14’ wide, 15 mph.
4. Natural surface, single lane, 10’ wide, 10 mph.

Maintenance Level:

A. Maintained for low clearance (<6”) vehicles (passenger cars).
B. Maintaned for high clearance (>6”) vehicles (pickups and 4wd).
C. Maintained for occasional 4wd administrative use only.
D. Not maintained.
E. Deactivated.

Traffic Management:

A. Open to traffic year-round
B. Gated seasonally
C. Gated year-round
D. Fixed barriers (boulders, posts, etc.)

For more information on the State Forest Road Classification System, see the Bureau of Forestry Policy.

Management Practice 7 – Treat Invasive Exotics

Practice Purpose:
Reduce or eliminate all occurences of invasive exotics in the FWC State Forest by 2018
Characteristics of areas most likely to meet objectives:
Stands with established populations of invasive exotics
Desired conditon of stands 15 years after practice is applied:
Reduced or no occurences of invasive exotics
Appropriate Treatments:
Physical removal
Herbicide application
Special conderations:
Herbicide aplication is the most effective treatment for large areas. This can pose short term threats to water quality that must be addressed before application

Management Practice 8 – Recreation Management

Practice Purpose:
Provide compatible recreational opportunities in the FWC State Forest by 2018
Characteristics of areas most likely to meet objectives:
Areas with existing recreational facilities
Desired conditon of stands 15 years after practice is applied:
Improved condition of existing campsites that provide a safe aethestically pleasing outdoor experience
Special conderations:
Any necessary work will be coordinated with the park supervisor

Appendix C – Native Species

The following checklist of organisms was generated during a visit to Women's Federated State in August 2003. Reconnaissance efforts were focused on areas of different plant associations within the forest. This listing is not a complete listing of observations but rather a record of the the plants and animals recognizable at the time of the visit. Identifications were made in the field without the aid of plant keys. There was no attempt to identify grasses, sedges, and mosses. Members of some genera such as *Aster* and S*olidago* were not identified down to the species level

Common Name	Species	native	Life form
shining clubmoss	Huperzia lucidula	n	fern or ally
princess pine	Lycopodium obscurum	n	fern or ally
common club-moss	Lycopodium clavatum	n	fern or ally
prickly princess pine	Lycopodium dendroidium	n	fern or ally
southern running-pine	Diphasiastrum digitatum	n	fern or ally
cut-leaved grape fern	Botyrichium dissectum	n	fern or ally
lace-frond grape-fern	Botrychium dissectum	n	fern or ally
royal fern	Osmunda regalis	n	fern or ally
cinnamon fern	Osmunda cinnamomea	n	fern or ally
interrupted fern	Osmunda claytoniana	n	fern or ally
hay-scented fern	Dennstaedtia punctilobula	n	fern or ally
bracken fern	Pteridium aquilinum	n	fern or ally
new york fern	Thelypteris noveboracensis	n	fern or ally
marsh-fern	Thelypteris palustris	n	fern or ally
intermediate wood-fern	Dryopteris intermedia	n	fern or ally
spinulose wood-fern	Dryopteris carthusiana	n	fern or ally
christmas-fern	Polystichum acrostichoides	n	fern or ally
sensitive fern	Onoclea sensibilis	n	fern or ally
sassafras	Sassafras albidum	n	vascular plant
white water-lily	Nymphaea odorata	n	vascular plant
virgin's bower	Clematis virginiana	n	vascular plant
tall meadow rue	Thalictrum pubescens	n	vascular plant
goldthread	Coptis trifolia	n	vascular plant
witch hazel	Hamamelis virginiana	n	vascular plant
stinging nettle	Urtica sp	?	vascular plant
false nettle	Boehmeria cylindrica	n	vascular plant
beaked hazelnut	Corylus cornuta	n	vascular plant
hornbean	Carpinus caroliniana	n	vascular plant
pokeweed	Phytolacca americana	n	vascular plant
dwarf St. Johnswort	Hypericum mutilum	n	vascular plant
marsh St. Johnswort	Triadenum virginicum	n	vascular plant
basswood	Tilia americana	n	vascular plant
spatulate-leaved sundew	Drosera intermedia	n	vascular plant
round-leaved violet	Viola rotundifolia	n	vascular plant
arrow-leaved violet	Viola sagittata	n	vascular plant

Common Name	Species	native	Life form
marsh blue violet	Viola cucullata	n	vascular plant
rosebud-azalea	Rhododendron prinophyllum	n	vascular plant
sheep laurel	Kalmia angustifolia	n	vascular plant
mountain laurel	Kalmia latifolia	n	vascular plant
maleberry	Lyonia ligustrina	n	vascular plant
wintergreen	Gaultheria procumbens	n	vascular plant
trailing arbutus	Epigaea repens	n	vascular plant
common lowbush	Vaccinium angustifolium	n	vascular plant
highbush blueberry	Vaccinium corymbosum	n	vascular plant
pipsissewa	Chimaphila umbellata	n	vascular plant
spotted wintergreen	Chimaphila maculata	n	vascular plant
round-leaved pyrola	Pyrola rotundifolia	n	vascular plant
indian pipe	Monotropa uniflora	n	vascular plant
whorled loosestrife	Lysimachia quadrifolia	n	vascular plant
swamp candles	Lysimachia terrestris	n	vascular plant
starflower	Trientalis borealis	n	vascular plant
meadow sweet	Spiraea alba	n	vascular plant
swamp dewberry	Rubus hispudus	n	vascular plant
common blackberry	Rubus allegheniensis	n	vascular plant
red chokeberry	Aronia arbutifolia	n	vascular plant
ground nut	Apios americana	n	vascular plant
bunchberry	Cornus canadensis	n	vascular plant
black gum	Nyssa sylvatica	n	vascular plant
winterberry holly	Ilex verticillata	n	vascular plant
Virginia creeper	Parthenocissus quinquefolia	n	vascular plant
fox grape	Vitis labrusca	n	vascular plant
striped maple	Acer pensylvanicum	n	vascular plant
poison ivy	Toxicodendron radicans	n	vascular plant
jewelweed	Impatiens capensis	n	vascular plant
wild sarsaparilla	Aralia nudicaulis	n	vascular plant
water pennywort	Hydrocotyle americana	n	vascular plant
deadly nightshade	Solanum dulcamara	I	vascular plant
mad-dog skullcap	Scutellaria lateriflora	n	vascular plant
marsh-skullcap	Scutellaria galericulata	n	vascular plant
northern water-	Lycopus uniflorus	n	vascular plant
self heal	Prunella vulgaris	n	vascular plant
monkey flower	Mimulus ringens	n	vascular plant
indian tobacco	Lobelia inflata	n	vascular plant
cardinal-flower	Lobelia cardinalis	n	vascular plant
partridgeberry	Mitchella repens	n	vascular plant
buttonbush	Cephalanthus occidentalis	n	vascular plant
marsh bedstraw	Galium palustre	n	vascular plant
morrow's honeysuckle	Lonicera morrowii	I	vascular plant
maple-leaf viburnum	Viburnum acerifolium	n	vascular plant

Common Name	Species	native	Life form
nannyberry	Viburnum lentago	n	vascular plant
hobblebush	Viburnum lantanoides	n	vascular plant
common elderberry	Sambucus canadensis	n	vascular plant
beggar ticks	Bidens connata	n	vascular plant
fireweed	Erechtites hieraciifolia	n	vascular plant
swamp goldenrod	Solidago uliginosa	n	vascular plant
zigzag goldenrod	Solidago flexicaulis	n	vascular plant
common white heart-	Aster divaricatus	n	vascular plant
whorled aster	Aster acuminatus	n	vascular plant
eastern joe-pye weed	Eupatorium dubium	n	vascular plant
gall-of-the-earth	Prenanthes trifoliolata	n	vascular plant
skunk-cabbage	symplocarpus foetidus	n	vascular plant
jack-in-the-pulpit	Arisaema triphyllum	n	vascular plant
path rush	Juncus tenuis	n	vascular plant
star sedge	Carex echinata	n	vascular plant
bur-reed	Sparaganium sp	n	vascular plant
pickerel-weed	Pontederia cordata	n	vascular plant
red trillium	Trillium erectum	n	vascular plant
indian cucumber root	Medeola virginiana	n	vascular plant
blue bead lily	Clintonia borealis	n	vascular plant
false solomon's seal	Smilacina racemosa	n	vascular plant
Canaday mayflower	Maianthemum canadense	n	vascular plant
hairy solomon's seal	Polygonatum pubescens	n	vascular plant
carrion flower	Smilax herbacea	n	vascular plant
larger blue flag	Iris versicolor	n	vascular plant
pink lady's slipper	Cypripedium acaule	n	vascular plant
downy rattlesnake plantain	Goodyera pubescens	n	vascular plant
fringed gentian	Gentiana critina	n	vascular plant
Eastern Chipmunk	Tamias striatus	n	mammal
Beaver	Castor canadensis	n	mammal
Black Bear	Ursus americanus	n	mammal
Mink	Mustela vison	n	mammal
White-tailed Deer	Odocoileus virginianus	n	mammal
Moose	Alces alces	n	mammal
Water shrew	Sorex palustirs	n	mammal
Southern Bog Lemming	Synaptomys cooperi	n	mammal
Spotted Salamander	Ambystoma maculatum	n	amphibian
Eastern Newt	Notophthalmus viridescens	n	amphibian
Redback Salamander	Plethodon cinereus	n	amphibian
American Toad	Bufo americanus	n	amphibian
Spring Peeper	Pseudacris crucifer	n	amphibian
Bullfrog	Rana catesbetiana	n	amphibian
Green Frog	Rana clamitans	n	amphibian
Pickerel Frog	Rana palustris	n	amphibian

Common Name	Species	native	Life form
Spring Salamander	Gyrinophilus porphyriticus	n	amphibian
Four-toed Salamander	Hemidactylium scutatum	n	amphibian
Spotted Turtle	Clemmys guttata	n	reptile
Wood Turtle	Clemmys insculpta	n	reptile
Eastern Box Turtle	Terrapene carolina	n	reptile
Great Blue Heron	Ardea herodias	n	bird
Wood Duck	Aix sponsa	n	bird
American Black Duck	Anas rubripes	n	bird
Mallard	Anas platyrhynchos	n	bird
Hooded Merganser	Lophodytes cucullatus	n	bird
Cooper's Hawk	Accipiter cooperii	n	bird
Broad-winged Hawk	Buteo platypterus	n	bird
Wild Turkey	Meleagris gallopavo	n	bird
Barred Owl	Strix varia	n	bird
N. Saw-whet Owl	Aegolius acadicus	n	bird
Ruby-throated	Archilochus colubris	n	bird
Belted Kingfisher	Ceryle alcyon	n	bird
Downy Woodpecker	Picoides pubescens	n	bird
Hairy Woodpecker	Picoides villosus	n	bird
Eastern Wood-pewee	Contopus virens	n	bird
Eastern Phoebe	Sayornis phoebe	n	bird
Easten Kingbird	Tyrannus tyrannus	n	bird
Red-eyed Vireo	Vireo olivaceus	n	bird
Blue Jay	Cyanocitta cristata	n	bird
American Crow	Corvus brachyrhynchos	n	bird
Tree Swallow	Tachycineta bicolor	n	bird
Black-capped Chickadee	Poecile atricapillus	n	bird
Tufted Titmouse (bicolor)	Baeolophus bicolor	n	bird
Red-breasted Nuthatch	Sitta canadensis	n	bird
White-breasted Nuthatch	Sitta carolinensis	n	bird
Brown Creeper	Certhia americana	n	bird
Golden-crowned Kinglet	Regulus satrapa	n	bird
Veery	Catharus fuscescens	n	bird
Hermit Thrush	Catharus guttatus	n	bird
Wood Thrush	Hylocichla mustelina	n	bird
American Robin	Turdus migratorius	n	bird
Gray Catbird	Dumetella carolinensis	n	bird
Yellow Warbler	Dendroica petechia	n	bird
Magnolia Warbler	Dendroica magnolia	n	bird
Black-throated Blue Warbler	Dendroica caerulescens	n	bird
Yellow-rumped Warbler	Dendroica coronata	n	bird
Black-throated Green Warbler	Dendroica nigrescens	n	bird
Blackburnian Warbler	Dendroica fusca	n	bird
Pine Warbler	Dendroica pinus	n	bird
Black-and-white Warbler	Mniotilta varia	n	bird

Common Name	Species	native	Life form
American Redstart	Setophaga ruticilla	n	bird
Ovenbird	Seiurus aurocapillus	n	bird
Northern Waterthrush	Seiurus noveboracensis	n	bird
Louisiana Waterthrush	Seiurus motacilla	n	bird
Common Yellowthroat	Geothlypis trichas	n	bird
Canada Warbler	Wilsonia canadensis	n	bird
Scarlet Tanager	Piranga rubra	n	bird
Rufous-sided Towhee	Pipilo erythrophthalmus	n	bird
Song Sparrow	Melospiza melodia	n	bird
Swamp Sparrow	Melospiza georgiana	n	bird
White-throated Sparrow	Zonotrichia albicollis	n	bird
Northern Cardinal	Cardinalis cardinalis	n	bird
Rose-breasted Grosbeak	Pheucticus ludovicianus	n	bird
Red-winged Blackbird	Agelaius phoeniceus	n	bird
American Goldfinch	Carduelis tristis	n	bird
Bluet Damselfly	Enallagma sp?	n	insect
Common Green Darner	Anax junius	n	insect
Common Whitetail	Libellula lydia	n	insect
Meadow Hawk (Ruby?)	Sympetrum sp?	n	insect

Appendix D – Public Comment / Response

1.0 Reserve Areas:

1.1 No cutting should be done in reserve areas

Response: Vegetation management is limited in reserve areas to restoration and maintenance of natural ecological conditions and in situations where there are significant forest health and public safety risks.

1.2 Have you set aside some unmanaged areas?

Response: Approximately 20% of FWC has been identified as reserve areas.

1.3 How are reserves selected?

Response: Reserves were identified by consolidating forested and non-forested areas within the wetland complex and in consideration of rare species and biodiversity.

1.4 If there is no old growth presently on the land, identify sites where it is likely to be achieved, and preserve them.

Response: The FWC Plan recognizes the need to provide a variety of forested conditions. Presently, stand conditions are predominately reaching the initial stages of maturity. There are no over-mature (old-growth) stands. The FWC Plan calls for providing approximately 20% of the area in reserves, approximately 8.5% of the area in extended rotation status, approximately 4% in filter strips, and the retention of biological legacy trees in managed stands. It is anticipated that over time these areas will become over-mature and have northeast "old growth" characteristics.

2.0 Vegetation Management:

2.1 How are lots selected for treatment?

Response: Treatment priorities are based on providing for rare species habitat and biodiversity goals; reducing risk of natural disturbances; restoring native ecosystems; restoring and maintaining forest health conditions and providing a sustainable flow of forest products. Stands within these priorities are further prioritized by completing previously initiated regeneration harvest; regenerating stands that are at imminent mortality risk; regenerating poorly stocked or off site stands; improving low quality stands; regenerating mature stands and thinning immature stands.

2.2 Can you have some areas of early successional habitat move through the forest?

Response: The FWC has been zoned into two management areas – General Natural Resource and Special Management Areas. The General Natural Resource Area is designed to provide a variety of habitats from early successional to overmature forest. Within the Special Management Area, although the desired condition is overmature, late successional habitat, over time it can be expected that natural processes will create early successional habitat.

2.3 Concern that cutting hemlock may eliminate trees resistant to HWA

Response: When hemlock stands are treated, there is a possibility and risk that some HWA resistant hemlock trees may be eliminated. The majority of stands containing a high composition of hemlock are not scheduled for treatment in this planning period.

2.4 Concern that without planting regeneration goals in hemlock stands will be hard to meet. Suggest planting seedlings or using acorns

Response: The FWC area is well suited to the natural establishment oak and pine. Past harvesting experience in FWC demonstrates that regeneration goals should be met with little difficulty.

2.5 Need to define balanced age classes

Response: FWC balanced age classes by providing approximately 8.5% of the area in each 15 year age class except late successional, seral state, where approximately 30% of the area will be maintained.

2.6 The plan should more fully consider the cutting trends across the state that show greater removal rates of tree species with higher commercial value than those of lower value.

Response: The FWC forest plan is based on providing high ecological and economic forest values. A diversity of species of all ages and sizes are planned.

2.7 DCR should do more than the minimum required by the Forest Cutting Practices Act with respect to vernal pools and wetland buffer/filter strips.

Response: The FWC forest plan incorporates by reference the MA Forestry Best Management Practices for wetlands, buffers, and filter strips. Reserves and extended rotation areas are or will be designed to compliment aquatic features. At a minimum, the MA Forestry Best Management Practices will serve as objectives for the management of these aquatic features. Certified and potential vernal pools

have specific designed management guidelines that exceed the MA Forestry Best Management Practices.

2.8 The statement at the top of the "Matrix Table" for prioritizing management practices "in general, practices that fulfill more objectives should receive priority" should be removed. Individual objectives such as establishing set-asides should be considered important by themselves.

Response: The matrix table was removed. The plan was developed to meet the desired conditions of all resources. The plan also focused on a set of priorities designed to direct forest plan implementation.

2.9 I would advocate for more than two stands of hemlocks to be preserved.

Response: The FWC plans to include two stands of hemlock in reserve areas and defers management in an additional two stands of hemlock. In addition, reserve, extended rotation, and filter strip areas over time may succeed to hemlock stands. Overall, the FWC provides a strategy to maintain a component of hemlock as stands or individuals.

3.0 Invasive Species

3.1 DCR should work with EOEA, environmental groups, and academic institutions to develop a strategy for dealing with invasive species.

Response: DCR is in agreement and further advocates inventory, monitoring, and integrated pest management designed to effectively and efficiently treat undesirable invasives.

3.2 Cutting in areas free of invasives may facilitate their establishment. The plan should include measures to minimize these effects.

Response: The FWC recognizes the concern and incorporated strategies that deal with the establishment of invasives.

4.0 Wildlife Considerations

4.1 Include more explanation of the habitat criteria/target characteristics goals and objectives

Response: The revised FWC forest plan provided additional information concerning species and habitat existing conditions, desired conditions, goals, and objectives in response to this issue.

4.2 There is little information provided on the natural community types or special characteristics that may be present within these stands, or what effects the proposed management activities will have on wildlife and habitat.

Response: The FWC forest plan provides information on the natural community types and special characteristics. Although the effects of management activities are not documented, the desired conditions for all resources including wildlife, are well documented. Monitoring and adaptive management strategies were developed to evaluate the effects and effectiveness of the current plan. The plan is designed to provide for rare species and land features first, as well as the long term sustainability of all resources (soil, water, air, timber).

5.0 Information

5.1 Concern that data collection is not detailed enough

Response: The best information available was used for the development of the FWC Plan. As new information becomes available, it will be assessed and when necessary used to update the FWC Plan.

5.2 How will results be made public and documented through time?

Response: The plan will be made available on the DCR website, at regional offices, and upon request. Every 15 years a review of the plan will be made and updated if needed.

5.3 Suggestion to confer with Harvard Forest on studies and maps.

Response: The Bureau coordinates with Harvard Forest and intends to continue working with them during the development of forest plans.

6.0 Recreation

6.1 Will recreational areas and eco-tourism be included in the management plan?

Response: Recreation and eco-tourism were considered in the FWC Plan. The FWC is a Focus Forest and interpretation of the natural resources is anticipated.

6.2 Offer to involve New England Mountain Bike Association for trail design, patrolling, maintenance, and management assistance

Response: There are limited opportunities for new mountain bike trails in FWC because it is a 1000 acre forest. The New England Mountain Bike Association offer may be better suited in state forests that are larger.

6.3 Need to maintain wildlife refuge signs.

Response: Signs will be maintained in the wildlife refuge area.

7.0 Social and Economic Considerations

7.1 Hire local foresters when necessary to write/implement plans

Response: The Bureau intends to utilize local foresters where possible and funding is available to prepare and implement harvest plans.

7.2 Bid out plan implementation as a complete package to local foresters/timber harvesters.

Response: The Bureau will consider stewardship type arrangements where the entire state forest is managed by contract to implement the forest plan.

7.3 Bid out sales in 300-500 acre blocks and allow an extended time period to complete the contract

Response: The Bureau intends to bid out sales of varying sizes in order to provide opportunities for both small and large businesses. At this time, the Bureau does not intend to lengthen the contract termination date of timber sales due to past difficulties with purchasers not completing the work in a timely fashion.

7.4 Educate banks and lending institutes to help small and medium sized operators

Response: This comment is outside the scope of the FWC Forest Plan and the mission of the Bureau of Forestry.

7.5 Promote local wood products industry and forest use in the planning process

Response: The FWC Forest Plan provides forest products, recreation, special uses and a variety of other opportunities as a result of the planning process.

7.6 I would advocate for more citizen involvement in creating management plans.

Response: A public involvement strategy has been developed for future plans that will meet legal requirements and allow for input from interested parties.

Appendix E – Glossary

Acceptable Growing Stock (AGS) - See **Management Potential**.

Aesthetics - forest value, rooted in beauty and visual appreciation, affording inspiration, contributing to the arts, and providing a special quality of life.

Allowable Harvest - the calculation of the amount of forest products that may be harvested, annually or periodically, from a specified area over a stated period, in accordance with the objectives of management.

Aspect - the orientation of a slope with respect to the compass; the direction toward which a slope faces; north facing slopes are generally cooler than south facing slopes.

Basal area - a measurement of the cross-sectional area of a tree trunk, in square feet, at breast height. Basal area (BA) of a forest stand is the sum of the basal areas of the individual trees, and is reported as BA per acre.

Biological diversity - the variety of plants and animals, the communities they form, and the ecological functions they perform at the genetic, stand, landscape, and regional levels.

Biological legacy - an organism, a reproductive portion of an organism, or a biologically derived structure or pattern inherited from a previous ecosystem —Note: biological legacies often include large trees, snags, and down logs left after harvesting to provide refugia and to structurally enrich the new stand.

Biological maturity - the point in the life cycle of a tree at which there is no net biomass accumulation; the stage before decline when annual growth is offset by breakage and decay. See **Financial Maturity**

Biomass - the total weight of all organisms in a particular population, sample, or area; biomass production may be used as an expression of site quality.

BMP - Abbrev. *Best Management Practices.*

Board foot - See V**olume, tree**

Bole - the main trunk of a tree.

Broad-based dip - an erosion control structure similar to and having the same purpose as a waterbar. Structurally, broad-based dips differ in that they are generally longer, less abrupt, often are paved with stone and are more appropriately used on truck roads. See **Waterbar.**

Browse - portions of woody plants including twigs, shoots, and leaves used as food by such animals as deer.

Buffer Strip - a forest area of light cutting where 50% or less of the basal area is removed at any one time (Ch. 132 regs.).

Canopy - the upper level of a forest, consisting of branches and leaves of taller trees. A canopy is complete (or has 100 percent cover) if the ground is completely hidden when viewed from above the trees.

Catastrophic Risk - high high health and safety risk factors to people, high damage to human structures, or high destruction of forest conditions.

CCF - Hundreds of cubic feet. See **Volume, tree.**

CFI - Abbrev. *Continuous Forest Inventory;* a sampling method using permanent plots that are visited periodically to inventory large forest properties. Its purpose is to ascertain the condition of the forest as regards health, growth, and other ecosystem dynamics. With this information, long-term forest management policy is formulated to serve the needs of its owners.

Cleaning - See **Intermediate Cuttings.**

Coarse Woody Debris (CWD) - Dead and down woody material that is generally greater than 3" in diameter. See **Biological Legacy**

Cord - See **Volume, tree.**

Compartment - a subdivision of a forest property for administrative convenience and record keeping purposes

Community - a collection of living organisms in a defined area that function together in an organized system through which energy, nutrients, and water cycle.

Conservation - the wise use and management of natural resources.

Coppice Cutting - See **Regeneration Cutting**.

Corridor - a strip of wildlife habitat, unique from the landscape on either side of it, that links one isolated ecosystem "island" (e.g., forest fragment) to another. Corridors allow certain species access to isolated habitat areas, which consequently contributes to the genetic health of the populations involved.

Critical habitat - Uncommon habitat of great value to wildlife such as abandoned fields, orchards, aspen stands, blueberry barrens, cliffs, talus, caves, etc.

Crop tree - a term traditionally reserved to describe a tree of a commercially desirable species, with the potential to grow straight, tall, and vigorously. However, a crop tree can be one selected for nontimber purposes (varying with landowner objectives), such as mast production or den tree potential. See **Management Potential**

Crown class - an evaluation of an individual tree's crown in relation to its position in the canopy and the amount of full sunlight it receives. The four recognized categories are: dominant (D), codominant (C), intermediate (I), and overtopped or suppressed (S).

Cull Tree - a live tree of commercial species that contains less than 50% usable material.

Ro*ugh cull:* a tree whose primary cause of cull is crook, sweep, etc.

Rotten cull: a tree whose primary cause of cull is rot.

Danger tree - A standing tree that presents a hazard to emplyees due to conditions such as, but not limited to, deterioration or physical damage to the root system, trunk, stems or limbs, and the direction and lean of the tree. OSHA 1910.266, Logging Operations

Daylight - verb; to cut vegetation adjacent to a road or other open area to increase solar insolation to its surface.

DBH - abbrev. *diameter at breast height*; the diameter at breast height of a standing tree measured at 4.5' above the ground.

Den Tree-living hollow trees that are used for shelter by mammals or birds. Syn.; cavity tree.

Diameter-limit cut - a timber harvesting treatment in which all trees over a specified diameter may be cut. See **High Grading**.

Disturbance - a natural or human-induced environmental change that alters one or more of the floral, faunal, and microbial communities within an ecosystem. Timber harvesting is the most common human disturbance. Windstorms and fire are examples of natural disturbance.

Ecology - the study of interactions between living organisms and their environment.

Economic Maturity - See **Financial Maturity**

Ecosystem - a natural unit comprised of living organisms and their interactions with their environment, including the circulation, transformation, and accumulation of energy and matter.

Ecosystem management - Forest management that is applied with emphases on 1.) maintaining biodiversity, 2.) addressing societal or social needs, and 3.) being adaptive. See **Forest Management**.

Ecotype - a genetic subdivision of a species resulting from the selective action of a particular environment and showing adaptation to that environment. Ecotypes may be geographic, climatic, elevational, or soil-related.

Edge - the boundary between open land and woodland or between any two distinct ecological communities. This transition area between environments provides valuable wildlife habitat for some species, but can be problematic for some species, due to increased predation and parasitism. Syn.: ecotone

Endangered species - See **Rare Species**

Even-aged stand - See **Stand Structure**.

Featured Resource - the resource that is the primary focus of management activities.

Financial maturity - the point in the life cycle of a tree or stand when harvesting can be most profitable, i.e., when the rate of value increase of an individual tree or stand falls below a desired alternative rate of return. Syn.: Economic Maturity

Forest land - Land that is at least 10% stocked with trees.

Forest interior dependent species - animal species that depend upon extensive areas of continuous, unbroken forest habitat to live and reproduce, and are susceptible to higher rates of predation and population decline when interior forest habitat is fragmented or disturbed. See **Fragmentation.**

Forest management - the practical application of biological, physical, quantitative, managerial, economic, social and policy principles to the regeneration, management, utilization and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest.

Forest Road - A road owned by and under the jurisdiction of the Department of Conservation and Recreation, Division of Parks and Recreation.

Forest type - aggregations of tree species that commonly occur because of similar ecological requirements. Four major forest types in Massachusetts are northern hardwoods, oak/hickory, white pine and oak/pine. Syn. forest association.

Filter Strip - an area of forest land, adjoining the bank of a water body, where no more than 50% of the basal area is harvested at any one time (Ch. 132 regs.).

Fragmentation, forest - the segmentation of a large tract or contiguous tracts of forest to smaller patches, often isolated from each other by nonforest habitat. Results from the collective impact of residential and commercial development, highway and utility construction, and other piecemeal land use changes.

Ford - a stream crossing using a stable stream bottom as the roadbed.

Fuel management - the act or practice of controlling flammability and resistance to control of wildland fuels through mechanical, chemical, biological or manual means, or by fire in support of land management objectives.

Girdling - a method of killing unwanted trees by cutting through the living tissues around the bole. Can be used instead of cutting to prevent felling damage to nearby trees. Girdled trees can provide cavities and dead wood for wildlife and insects.

GIS - Geographic Information System. A computer-based system for collecting, storing, updating, manipulating, displaying and analyzing geographically referenced data.

GPS - Global Positioning System. A satellite-based navigation system.

Grade - the angle of an inclined surface as expressed in terms of percent slope: vertical rise per 100' of horizontal run.

Grade, tree - A classification system for standing trees that is based on their potential for yielding high value lumber.

Growing Stock - For inventory purposes, all live trees that are between 5.0” dbh to 10.9” dbh and are greater than 50% sound. See **Management Potential**

Growth, net - The average annual net increase in the volume of trees expressed either as a per acre value or total value for a given unit of land. Mathematically it is expressed as follows: {[growth of the existing trees at the beginning of the period]+ [ingrowth the volume of trees that have reached merchantability during the period]} – {(the volume of trees that have died during the period) + (the volume of trees that have become cull during the period.

Habitat - the geographically defined area where environmental conditions (e.g., climate, topography, etc.) meet the life needs (e.g.,. food, shelter, etc.) of an organism, population, or community.

High-grading - a type of timber harvesting in which larger trees of commercially valuable species are removed with little regard for the quality, quantity, or distribution of trees and regeneration left on the site; often results when a diameter limit harvest is imposed. See **Diameter Limit Cutting.**

Herbaceous - A class of vegetation dominated by non-woody plants known as herbs; [graminoids (grass), forbs and ferns].

Incidental taking - the taking of a rare species that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Intermediate Cuttings - Operations conducted in a stand during its development from regeneration stage to maturity. These are carried out to improve the quality of the existing stand, increase its growth and provide for earlier financial returns, without any effort directed at regeneration.

Cleaning: a cutting made in a stand, not past the sapling stage, to free the best trees from undesirable individuals of the same age that overtop them or are likely to do so. See *weeding.*

Thinning: a cutting whose purpose is to control the growth of stands by adjusting stand density.

Salvage Cutting: a harvest whose primary purpose is to remove trees that have been or are in imminent danger of being killed or damaged by injurious agencies.

Weeding: a cutting made in a stand not past the sapling stage that eliminates or suppresses undesirable vegetation regardless of crown position. See *Cleaning.*

Landing - any place where round timber is assembled for further transport, commonly with a change in method. Generally, a cleared area where log trucks are loaded.

Legacy tree - a tree, usually mature or old-growth, that is retained on a site after harvesting or naturally disturbance to provide a biological legacy. . See **Biological Legacy**

Management plan - a document prepared by natural resource professionals to guide and direct the use and management of a forest property. It consists of inventory data and prescribed activities designed to meet ownership objectives.

Management potential - For forest inventory purposes, a classification method in which a tree is rated based on the likelihood that it will develop into a tree that will be structurally sound, vigorous and yield products of high value. The three classes are as follows:

Preferred Crop Tree: the highest class; a tree with a dominant crown and no or minimal sweep or crook and no or few limbs in the butt 16' log.

Acceptable Growing Stock: a tree of codominant or greater crown class with moderate sweep or crook and a moderate number of limbs in the butt 16' log.

Unacceptable Growing Stock: Any tree not meeting the above criteria.

Also, see **Growing stock**

Mast - Seed produced by woody-stemmed, perennial plants, generally referring to soft (fruit) or hard (nut) mast.

Matrix, forest - The most extensive and connected landscape element that plays the dominant role in landscape functioning.

MBF - Abbrev. Thousands of board feet. See **Tree Volume**

Merchantable - of trees, crops or stands, of a size, quality and condition suitable for marketing under given economic conditions even if so situated as not to be immediately accessible for logging. See **Operable.**

Multiple use and value - a conceptual basis for managing a forest area to yield more than one use or value simultaneously. Common uses and values include aesthetics, water, wildlife, recreation, and timber.

Niche - the physical and functional location of an organism within an ecosystem; where a living thing is found and what it does there.

Old growth stand - A stand that has been formally designated as an old growth stand. These areas must meet a preponderance of the following four criteria: 1.) Be of a size that is large enough to be self sustaining. 2.) Show no evidence of significant post-European disturbance. 3.) Should have a component of trees that are greater than 50% of the maximum longevity for that species. 4.) Shall be a makeup that is self-perpetuating.

Old growth attributes - attributes often associated with old growth forests such as large amounts of coarse woody debris, large trees, etc. that are achieved through deliberate actions in a managed forest. See **Biological legacy**

Operable - trees, crops or stands that are both merchantable and accessible for harvesting. See **Merchantable.**

Patch - a small area of a particular ecological community surrounded by distinctly different ecological communities, such as a forest stand surrounded by agricultural lands or a small opening surrounded by forestland.

Poletimber - See **Size Class**.

Population - a group of individuals of one plant or animal taxon (species, subspecies, or variety).

Preservation - a management philosophy or goal which seeks to protect indigenous ecosystem structure, function, and integrity from human impacts. Management activities are generally excluded from "preserved" forests.

Raptor - A bird of prey.

Rare species - A collective term used to describe species listed under the MA Endangered Species Act as *endangered*, *threatened*, or of *special concern*.

Endangered: native species which are in danger of extinction throughout all or part of their range, or which are in danger of extirpation from Massachusetts, as documented by biological research and inventory.

Threatened: native species which are likely to become endangered in the foreseeable future, or which are declining or rare as determined by biological research and inventory.

Special concern: native species which have been documented by biological research or inventory to have suffered a decline that could threaten the species if allowed to continue unchecked, or which occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become threatened within Massachusetts.

Recreation, outdoor - Outdoor recreation is generally considered to be of two types. *Extensive recreation* is that which occurs throughout a large area and is not confined to a specific place or developed facility e.g., hunting, fishing, hiking, horseback riding, snowmobiling, crosscountry skiing, etc. Syn, dispersed. *Intensive recreation* includes high density recreational activities that take place at a developed facility e.g., camp and picnic grounds and swimming beaches.

Regeneration - the renewal of a tree crop, whether by natural or artificial means - may be broken down into those treatments that produce stands originating from seed (high forest) or from vegetative regeneration (coppice or sprouts) and create even-aged or uneven-aged stands. Syn. reproduction.

Regeneration Cutting - Any removal of trees intended to assist regeneration already present or to make regeneration possible. The operation creates either an even-aged stand or an uneven-aged stand. See **Even-aged stand** and **Uneven-aged stand**

Clearcutting; (even-aged) removal of the entire stand in one cutting with reproduction obtained artificially or by natural seeding from adjacent stands or from trees cut in the clearing operation.

Seed-tree: (even-aged) removal of the old stand in one cutting, except for a small number of seed trees left singly or in groups.

Shelterwood: (even-aged) removal of the old stand in a series of cuttings, which extend over a relatively short portion of the rotation, by means of which the establishment of essentially even-aged reproduction under the partial shelter of seed trees is encouraged.

Selection: (uneven-aged) removal of trees, throughout all size classes, either as single scattered individuals or in small groups at relatively short intervals, repeated indefinitely, by means of which the continuous establishment of reproduction is encouraged and an uneven-aged stand is maintained.

Coppice: (even-aged or uneven-aged) any type of cutting in which dependence is placed mainly on vegetative reproduction.

Regeneration interference - an impediment to regeneration due to competing vegetation, or soil/site limitations.

Release - removal of overtopping trees to allow understory or overtopped trees to grow in response to increased light.

Reproduction - Syn; Regeneration.

Reserve tree - a tree, pole-sized or larger, retained in either a dispersed or aggregated mannerafter the regeneration period under the clearcutting, seed tree, shelterwood, group selection or coppice methods. Syn. Standard, legacy tree

Residual stand - trees remaining following any silvicultural operation.

Riparian Area - an area in close proximity to a watercourse, lake, swamp or spring.

Rotation - the planned number of years between the formation or regeneration of a crop or stand and its final harvest at a specified stage of maturity.

Rotation, extended - a rotation longer than necessary to grown timber crops to financial maturity or size and generally used to provide habitat or nontimber values.

Salvage Cutting - See **Intermediate cutting**

Sapling - See **Size Class**

Sawtimber - See **Size Class.**

Seed Tree Cutting - See **Regeneration Cutting**.

Seedling - See **Size Class.**

Seep (Seepage) - Groundwater (as opposed to surface flow) escaping through or emerging from the ground along an extensive line or surface, as contrasted with a spring where water emerges from a localized spot..

Selection cutting - See **Regeneration Cutting**.

Selective cutting - a cutting that removes only a portion of trees in a stand. Note: selective cutting is a loose term that should not be confused with cutting done in accordance with the selection method, is not a recognized silvicultural system and is often synonymous with or associated with High Grading.

Shelterwood Cutting - See **Regeneration Cutting.**

Silviculture - the theory and practice of controlling forest establishment, composition, structure and growth.

Silvicultural prescription - a detailed, quantitative plan, at the stand level of resolution, for conducting a silvicultural operation.

Silvicultural System - a program for the treatment of a stand throughout a rotation. An even-aged system deals with stands in which the trees have no or relatively little difference in age. An uneven-aged system deals with stands in which the trees differ markedly in age.

Site - the combination of biotic, climatic, topographic, and soil conditions of an area; the environment at a location.

Site index – See **Site Quality.**

Site preparation - Hand or mechanized manipulation of a site designed to enhance the success of regeneration.

Site quality - the inherent productive capacity of a specific location (site) in the forest affected by available growth factors (light, heat, water, nutrients, anchorage); often expressed as site index – the height of the average tree in an even-aged stand at a given age. In New England 50 years is generally used as the base age.

Size Class:

Seedling; a young tree, less than sapling size of seed origin.

Sapling: a tree greater than 1" dbh and less than 4.9" dbh.

Poletimber: a tree greater than 4.9" dbh and less than sawtimber size.

Sawtimber: a tree greater than 11.0" dbh having at least 8' of usable length and less than 50% cull.

Slash - tops, branches, slabs, sawdust or debris resulting from logging or land clearing operations.

Slope, steep - An area where the average, sustained slope is greater than 50%. See **Grade.**

Snag - a standing dead tree, greater than 20' tall, which has decayed to the point where most of its limbs have fallen; if less than 20' tall it is referred to as a *stub*. A hard snag is composed primarily of sound wood, generally merchantable and a soft snag is composed primarily of wood in advanced stages of decay and deterioration. See **Biological legacy.**

Special concern, Species of - see **Rare species**

Species - a subordinate classification to a genus; reproductively isolated organisms that have common characteristics, such as eastern white pine or white-tailed deer.

Stand - a community of trees possessing sufficient uniformity as regards composition, constitution, age, spatial arrangement or condition to be distinguishable from adjacent communities, so forming a silvicultural or management entity.

Standard - a tree (or trees), which remain after the harvest in the coppice with standards regeneration method to attain goals other than regeneration. See **Reserve trees.**

Stand Condition - Stand condition is based on species age, size, quality, and stocking of the trees making up the main stand.

Non-stocked: Those stands less than 10% stocked with commercial tree species.

High Risk: Those stands which will not survive the next ten years, or in which, due to decay, insects, disease, mortality or other factors will have a net volume loss in the next ten years.

Sparse: Those stands that are not high risk, but which have less than 40 sq. ft. of basal area/acre.

Low Quality: Stands which are not sparse or high risk, but have less than 40 sq. ft. of basal area/acre in poletimber or sawlog trees that are classified as either acceptable or preferred growing stock..

Mature: An even-aged stand within 5 years of rotation age or beyond rotation age which does not fit into any of the above categories or an uneven-aged stand that exceeds the stocking and size criteria for that type.

Immature: Any stand more than 5 years from rotation age which does not fit into any of the above categories.

In Process of Regeneration: A stand in which work has been done to establish regeneration; site preparation, planting, seeding, shelterwood cutting, etc.

Stand Structure - A description of the distribution and representation of tree age and size classes within a stand.

Even-aged, single-storied: Theoretically, stands in which all trees are one age. In actual practice, these stands are marked by an even canopy of uniform height characterized by intimate competition between trees of approximately the same size. The greatest number of stems are in a diameter class represented by the average of the stand.

The ages of the trees usually do not differ by more than 20 years.

Even-aged, two-storied: Stands composed of two distinct canopy layers, such as, an overstory and understory sapling layer possibly from seed tree and shelterwood operations. This may also be true in older plantations where tolerant hardwoods may become established as management intensity decreases (burning and other means of understory control).

Two relatively even canopy levels can be recognized in the stand. Both canopy levels tend to be uniformly distributed across the.stand. The average age of each level differs significantly from the other.

Uneven-aged (sized): Theoretically, these stands contain trees of every age on a continuum from seedlings to mature canopy trees. In practice, uneven-aged stands are characterized by a broken or uneven canopy layer. The largest number of trees is in the smaller diameter classes. As trees increase in diameter, their numbers diminish throughout the stand. Agenerally, a stand with 3 or more structural layers may be considered as uneven-aged.

*Mosaic***:** At least two distinct size classes are represented and these are not uniformly distributed, but are grouped in small repeating aggregations, or occur as stringers less than 120 feet wide, throughout the stand. Each size class aggregation is too small to be recognized and mapped as an individual stand. The aggregations may or may not be even-aged.

Stewardship - the wise management and use of forest resources to ensure their health and productivity for the future with regard for generations to come.

Stocking - the degree of occupancy of an area by trees. In even-aged stands, stocking levels are expressed as different levels (A, B and C) based upon stocking guides that use tree diameter, basal area and number of trees per acre. The A level represents the density of undisturbed even-aged stands. The B level represents the minimum density for maximum basal area and cubic foot growth. The C level represents both the minimum stocking of acceptable growing stock to make a stand suitable for management for timber products and represents 10 years growth below the B level.

Overstocked: stands above the "A" level of stocking for their forest type, tree density and size class.
Fully stocked: stands between the "A" and "C" levels of stocking for their forest type, tree density and size class.
Understocked: stands below the "C" level of stocking for their forest type, tree density and size class.

In uneven-aged stands, stocking is based on residual basal area, maximum tree size and a ratio known as "Q" which is a mathematical expression of the desired diameter distribution.

Structure, horizontal - the spatial arrangement of plant communities; a complex horizontal structure is characterized by diverse plant communities within a given geographic unit.

Structure, vertical - the arrangement of plants in a given community from the ground (herbaceous and woody shrubs) into the main forest canopy; a complex vertical structure is characterized by lush undergrowth and successive layers of woody vegetation extending into the crowns of dominant and co-dominant trees. (See *crown class.)*

Stumpage value - the commercial value of standing trees.

Succession - the natural series of replacements of one plant community (and the associated fauna) by another over time and in the absence of disturbance.

Sustained yield - historically, a timber management concept in which the volume of wood removed is equal to growth within the total forest. The concept is applicable to nontimber forest values as well.

Thinning - See **Intermediate cuttings.**

Threatened species - See **Rare species**.

Tolerance - a characteristic of trees that describes the relative ability to thrive with respect to the growth factors (light, heat, water nutrients, anchorage). Usually used to describe shade tolerance: the ability of a species to thrive at low light levels.

T.S.I. - *timber stand improvement*; a loose term comprising all intermediate cuttings made to improve the composition, constitution, condition and increment of a timber stand. The practice may be *commercial*; yielding net revenues or *precommercial or noncommercial*; where the cost of accomplishing the work exceeds the value of the products removed.

Unacceptable Growing Stock (UGS) - See **Management Potential**.

Understory - the smaller vegetation (shrubs, seedlings, saplings, small trees) within a forest stand, occupying the vertical zone between the overstory and the herbaceous plants of the forest floor.

Uneven-aged stand - See **Stand Structure**

Vernal or autumnal ponds - a class of wetland characterized by small, shallow, temporary pools of fresh water present in spring and fall, which typically do not support fish but are very important breeding grounds for many species of amphibians. Some species are totally dependent upon such ponds; examples are spring peepers and mole salamanders.

Volume, tree - the contents of the merchantable portion of a tree, expressed either as 1.) Board foot volume, where a board foot is equivalent to a piece of wood 12” x 12” x 1” thick, excluding the waste inherent in processing; 2.) Cubic foot volume with no waste attributed to processing: 3.) Cord volume, where 80 cubic feet of solid wood are equivalent to one cord. One cord of wood contains 128 cubic feet of air, bark and wood or 4.) Tons of oven-dry wood.

Water Bar - a shallow depression, 12" to 36" wide, cut across a dirt road or skid trail at approximately a 30 degree angle to its alignment, for the purpose of diverting the overland flow of water from the surface of the road. See **Broad-based dip**.

Wetland - an area meeting the criteria for a wetland under Massachusetts General Laws, Chapter 131, the Wetlands Protection Act.

Wildlife tree - a live or dead tree designated for wildlife habitat or retained to become future wildlife habitat.

Appendix F – Statutory Policy and Guiding Principles

STATUATORY POLICY

CHAPTER 21. DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

ARTICLE OF FORESTS AND PARKS.

Chapter 21: Section 4F Bureau of forestry

[Text of section effective until July 1, 2003. Repealed by 2003, 26, Sec. 86. See 2003, 26, Sec. 715.]

Section 4F. The bureau of forestry shall, under the supervision of the director, with the approval of the commissioner perform such duties as respects forest management practices, reforestation, development of forest or wooded areas under the control of the department, making them in perpetuity income producing and improving such wooded areas. It shall be responsible for such other duties as are now vested in the division of forestry by the general laws or any special laws and shall be responsible for shade tree management, arboricultural service and insect suppression of public nuisances as defined in section eleven of chapter one hundred and thirty-two, subject to the approval of the director and, notwithstanding the provisions of any general or special law to the contrary, the bureau may require all tree spraying or other treatment performed by other departments, agencies or political subdivisions to be carried out under its direction. The bureau may promulgate rules and regulations to carry out its duties and powers. It shall assume the responsibilities of section one A of chapter one hundred and thirty-two and shall be responsible for such other duties as are not otherwise vested in the division of forestry; provided, however, that all personnel of the forest, fire, shade tree and pest control units in their respective collective bargaining units at the time of this consolidation to the bureau of forestry shall remain in their respective collective bargaining units.

Chapter 132, Section 40, provides a framework within which the Bureau of Forestry operates and defines its mission.

> *It is hereby declared that*
>
> *the **public welfare requires the rehabilitation, maintenance, and protection of forest lands** for the purpose of conserving water, preventing floods and soil erosion, improving the conditions for wildlife and recreation, protecting and improving air and water quality, and providing a continuing and increasing supply of forest products for public consumption, farm use and for the wood-using industries of the commonwealth,*

Therefore, it is hereby declared to be the policy of the Commonwealth that all lands devoted to ***forest growth shall be kept in such condition as shall not jeopardize the public interests****,*

and that the policy of the Commonwealth shall further be one of ***cooperation with the landowners and other agencies*** *interested in forestry practices for the proper and profitable management of all forest lands in the interest of the owner, the public and the users of forest products.*

GUIDING PRINCIPLES

Ecosystem Management

The principles of Ecosystem Management (EM) guide the Bureau of Forestry in carrying out its mission. In contrast with traditional, production-oriented resource management, ecosystem management is "…a philosophical concept for dealing with larger spatial scales; longer time frames; and in which management decisions must be socially acceptable, economically feasible and ecologically sustainable". Rather than setting commodity-based targets, EM defines desired conditions and develops strategies that lead to achieving them.

Although some have put forth more complex definitions, EM can be considered to have three main elements: biodiversity, a social component and adaptive management.

Article I. **Conserving Biodiversity:** "Biodiversity is the variety of life and its processes; and includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur."[1] Biodiversity may be sought on any scale: an entire landscape, an urban neighborhood or an aggregation of microscopic organisms. Generally speaking, the more diverse an ecosystem is, the more stable and resilient it is in the face of disturbance.

In EM, three types of diversity are considered. *Structural diversity* can occur within a small group of trees (stands) where multiple age and/or size classes may be present. The term can also relate to a landscape with an aggregation of even-aged stands or a mixture of forest and other types of open space such as farmland and water. *Compositional diversity* relates to a mix of organisms, across a variety of scales, from the landscape to the stand level. *Functional diversity* relates to the genetic diversity within a population and also to the ability of an ecosystem to support processes necessary for its functioning and perpetuation.

Social Component: EM considers humans to be an integral component of the ecosystem, with the ability to meet many of their needs through the thoughtful application of EM principles.

EM is collaborative, and public participation is a part of the decision-making process. Like all democratic processes, effective EM requires that participants be well-informed and willing to compromise to achieve consensus. When ownerships

are complex, some issues can only be brought to resolution by involving all of the stakeholders and creating partnerships through which desired conditions can be achieved.

Article II. **Adaptive Management:** Learning by this process occurs from the results of past actions. It is circular in nature, and its components are: plan, act, monitor and evaluate. If the desired results of an action have not been achieved, the actions are modified when the process begins anew. Monitoring and evaluation are accomplished through: resource inventories and their analyses, and deliberate and efficient record keeping.

The Role of Working Forests

To achieve its mission of balancing social needs with ecosystem health, the Bureau uses silviculture and other management tools to create a desired condition. Because the removal of trees is an extremely labor-intensive activity, current markets for wood products have a significant impact on the cost-effectiveness of creating desired conditions; some objectives will generate revenue and others will require an investment of revenue.

Action through Programs

The Bureau carries out its mission by managing the state forest and park system and by providing education, technical assistance, technology transfer, resource assessment, monitoring, regulatory oversight and outreach. It organizes and conducts this business through five program areas: Service Forestry (private lands), Management Forestry (state lands), Urban Forestry, Forest Health, and Marketing & Utilization. In the delivery of these programs, it cooperates with federal and other state agencies, municipalities, the business community, non-governmental organizations, academia and individual landowners.

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Appendix H – Maps and Tables

Figure 01
FWC Regional Landscape

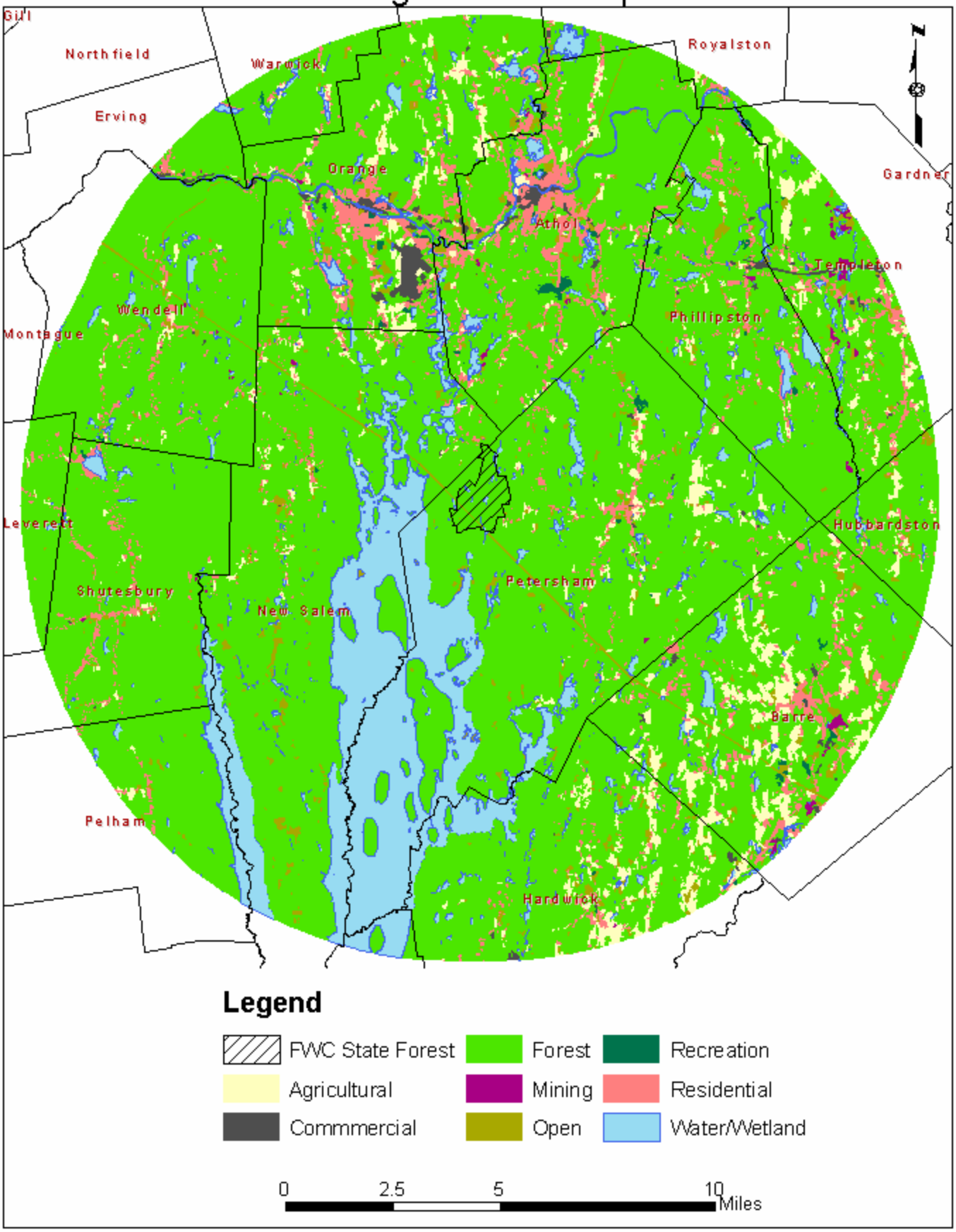

Figure 02
Protected Open Space

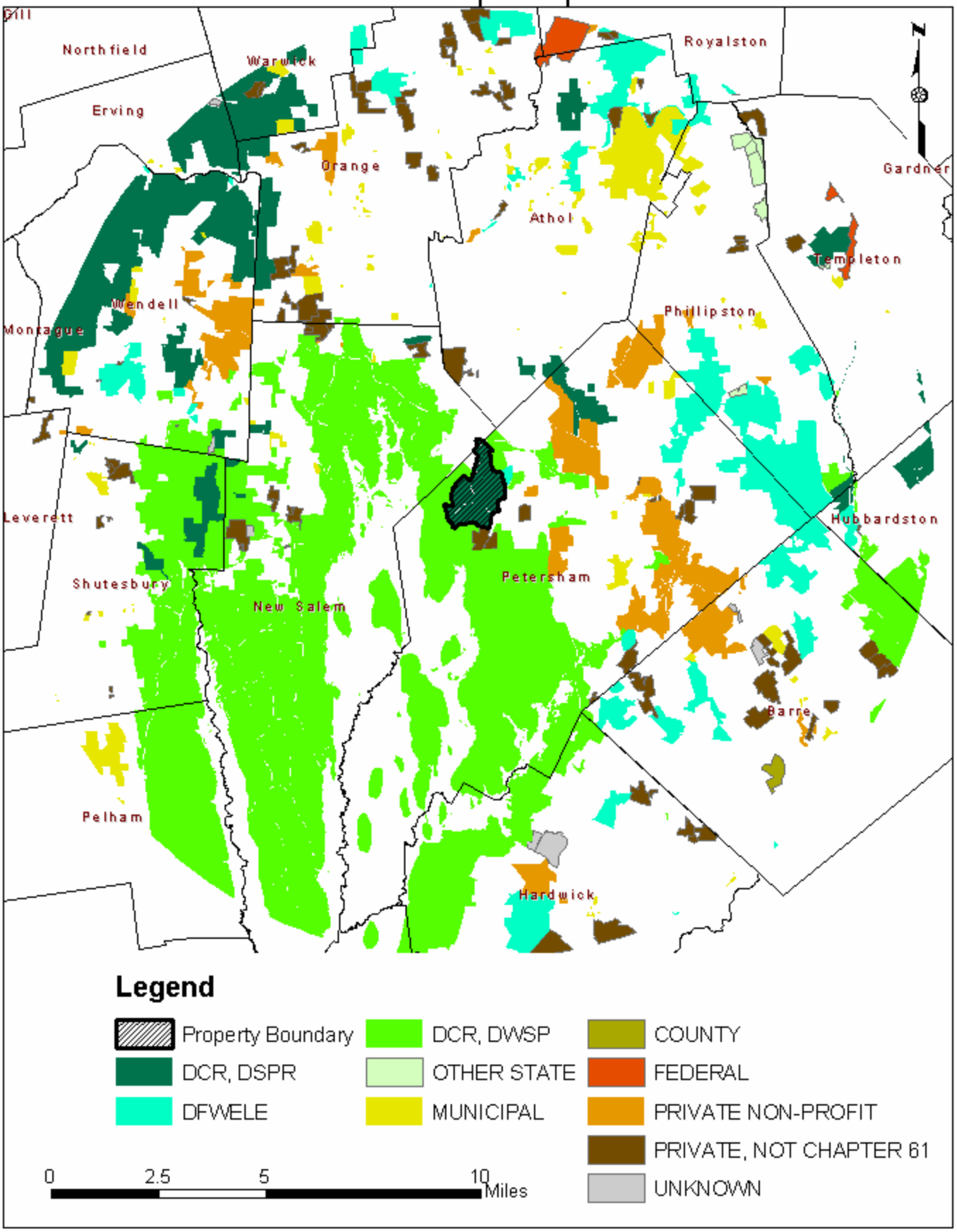

Figure 03
Forest Types

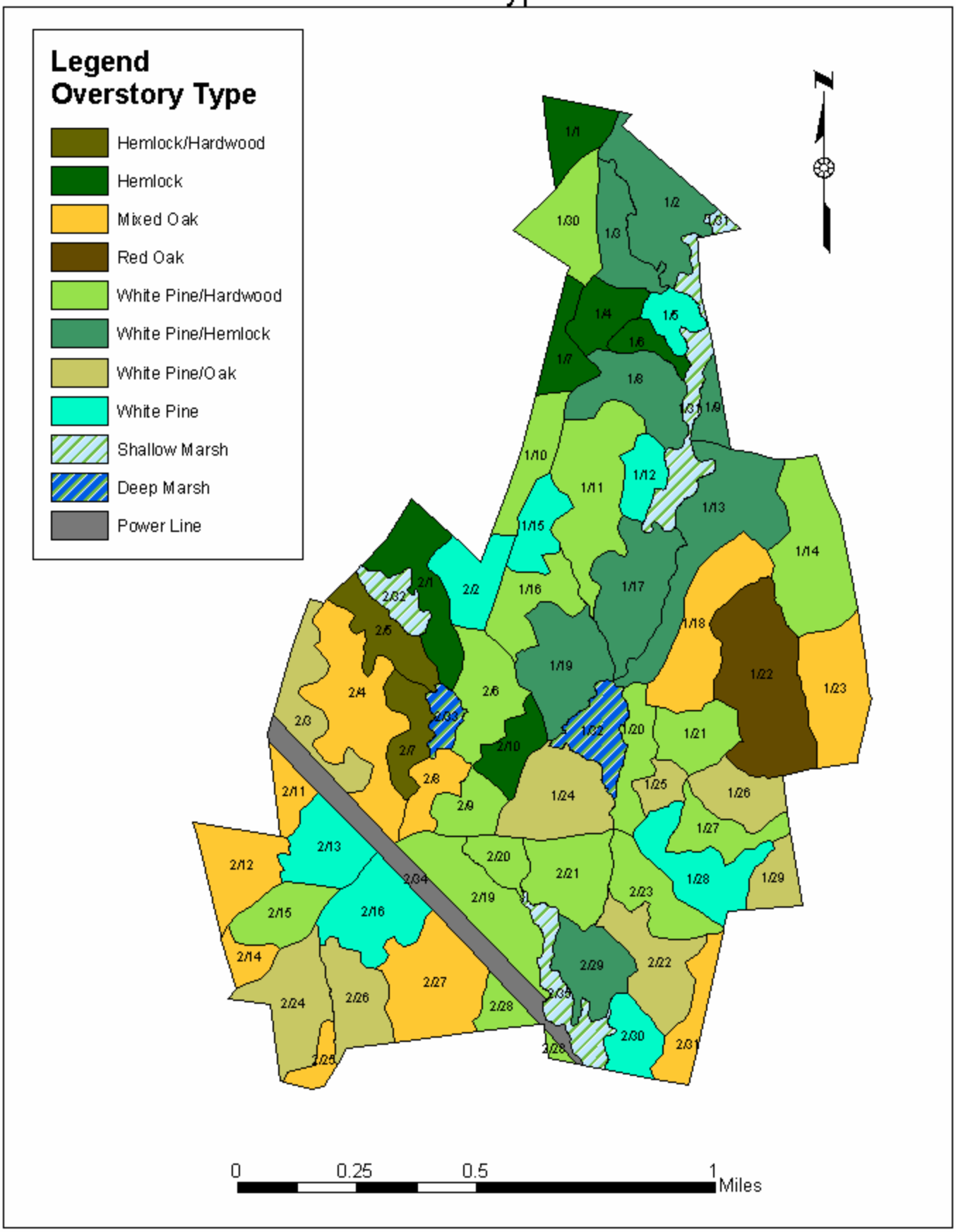

Figure 04
Merchantable Mean Stand Diameter

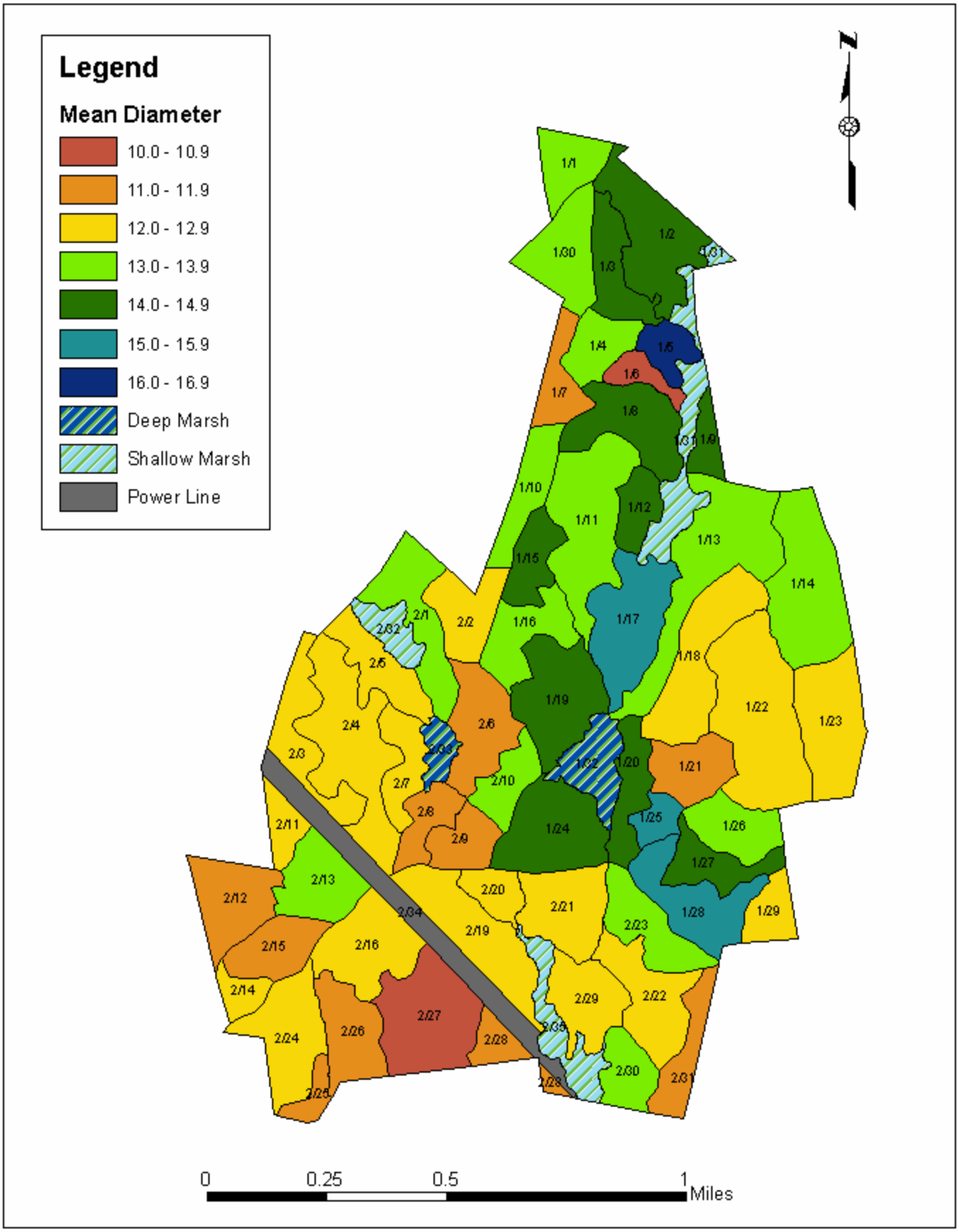

Figure 05
Age Class

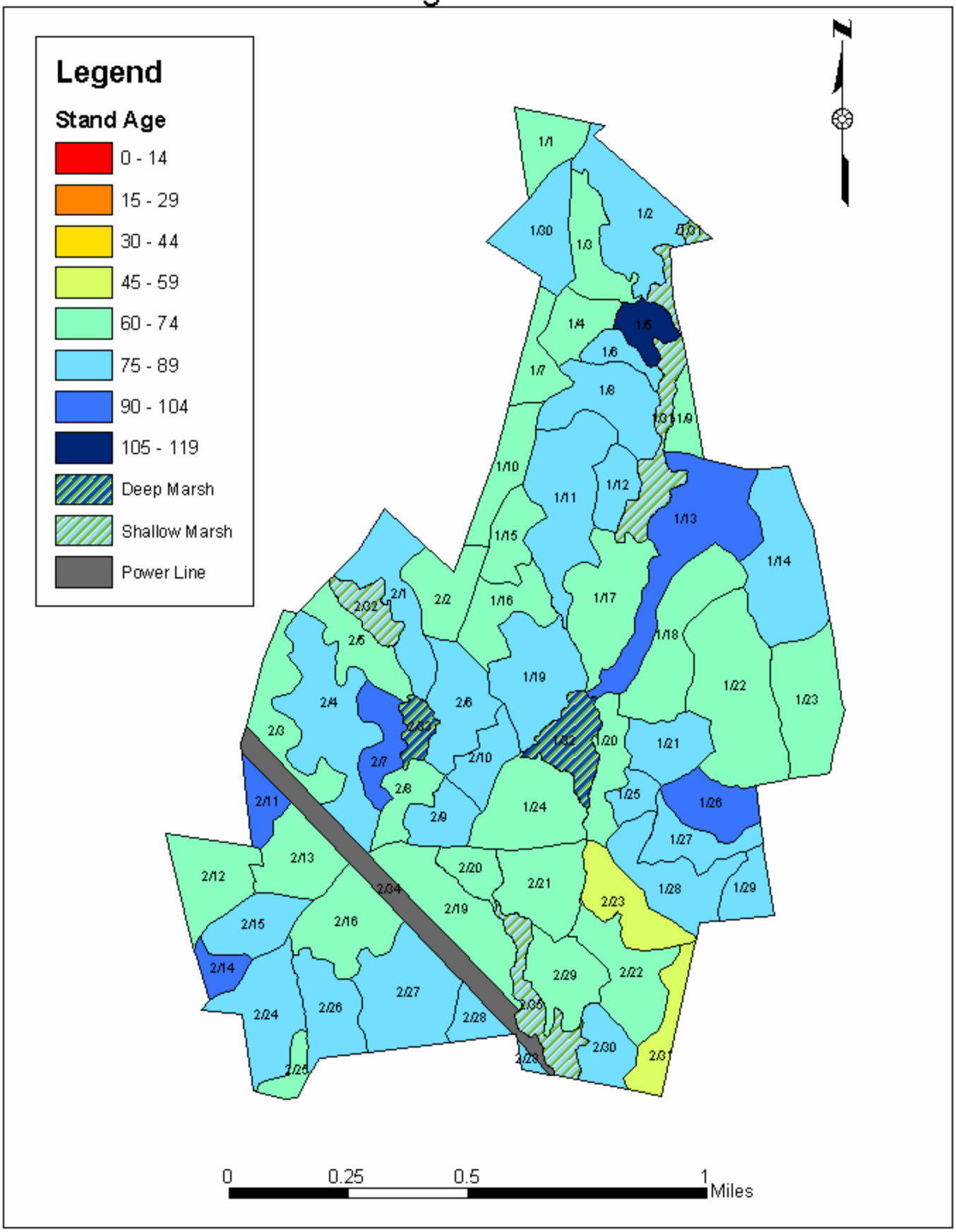

Figure 06
Site Index

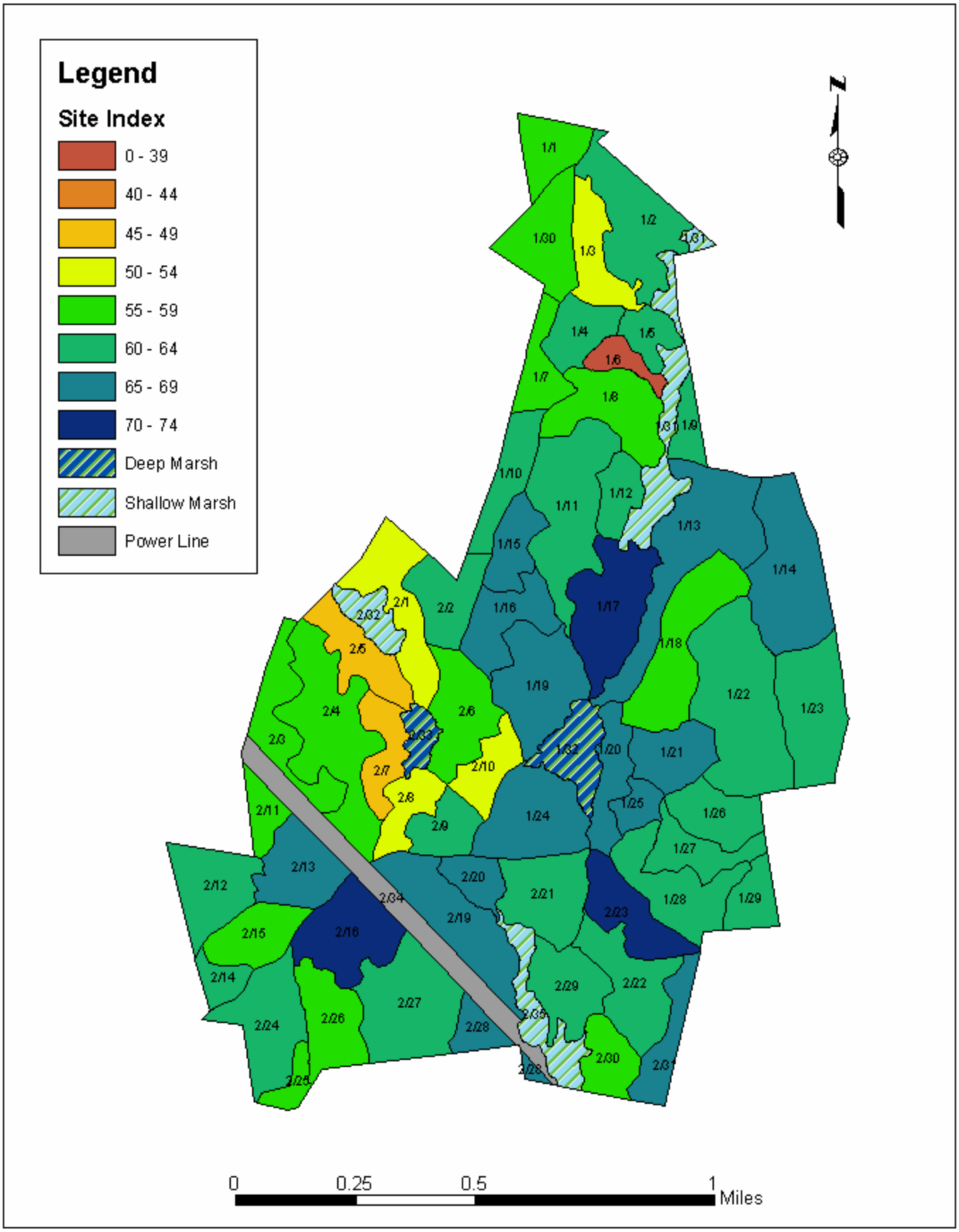

Figure 07
Vegetation Management

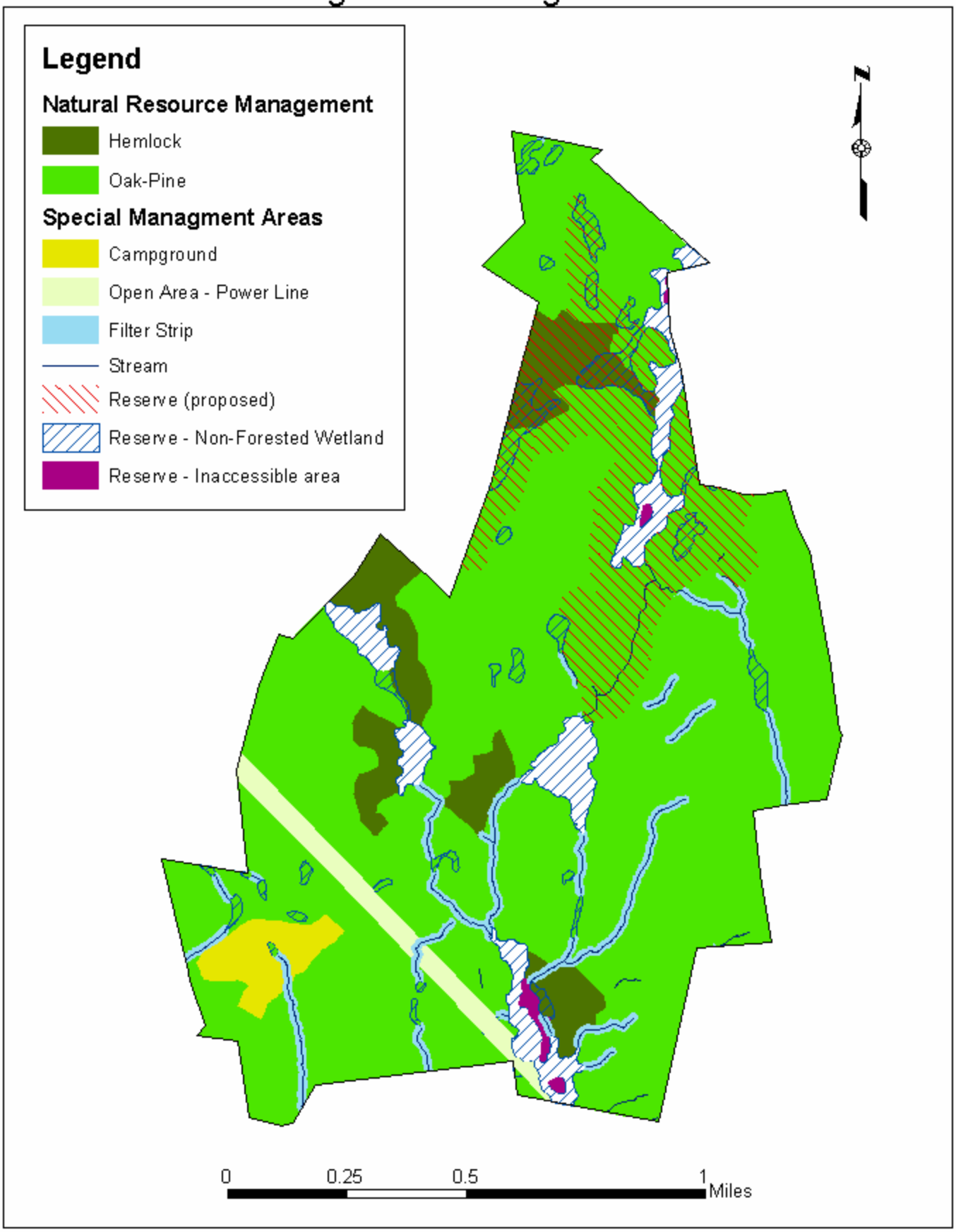

Figure 07A – Age Class Distribution

Oak-Pine Forest Type (Acres)

Age	2003	2018	2033	2048	2063	2078	2093	2108
0-14	0	85	85	85	85	85	85	85
15-59	25	0	85	170	255	255	255	254
60-104	786	710	635	0	0	85	170	254
104-150	0	0	0	591	506	421	0	0
150+	0	0	0	0	0	0	336	253
Total	**811**	**795**	**805**	**846**	**846**	**846**	**846**	**846**

Hemlock Forest Type (Acres)

Age	2003	2018	2033	2048	2063	2078	2093	2108
0-14	0	0	0	0	0	0	0	0
15-59	5	0	0	0	0	0	0	0
60-104	75	80	70	0	0	0	0	0
104-150	0	0	0	29	29	29	0	0
150+	0	0	0	0	0	0	29	29
Total	**80**	**80**	**70**	**29**	**29**	**29**	**29**	**29**

Upland Openings (Acres)

	2003	2018	2033	2048	2063	2078	2093	2108
Powerline	23	23	23	23	23	23	23	23
New	0	16	16	16	16	16	16	16
Total	**23**	**39**	**39**	**39**	**39**	**39**	**39**	**39**

Figure 08
Cultural Features

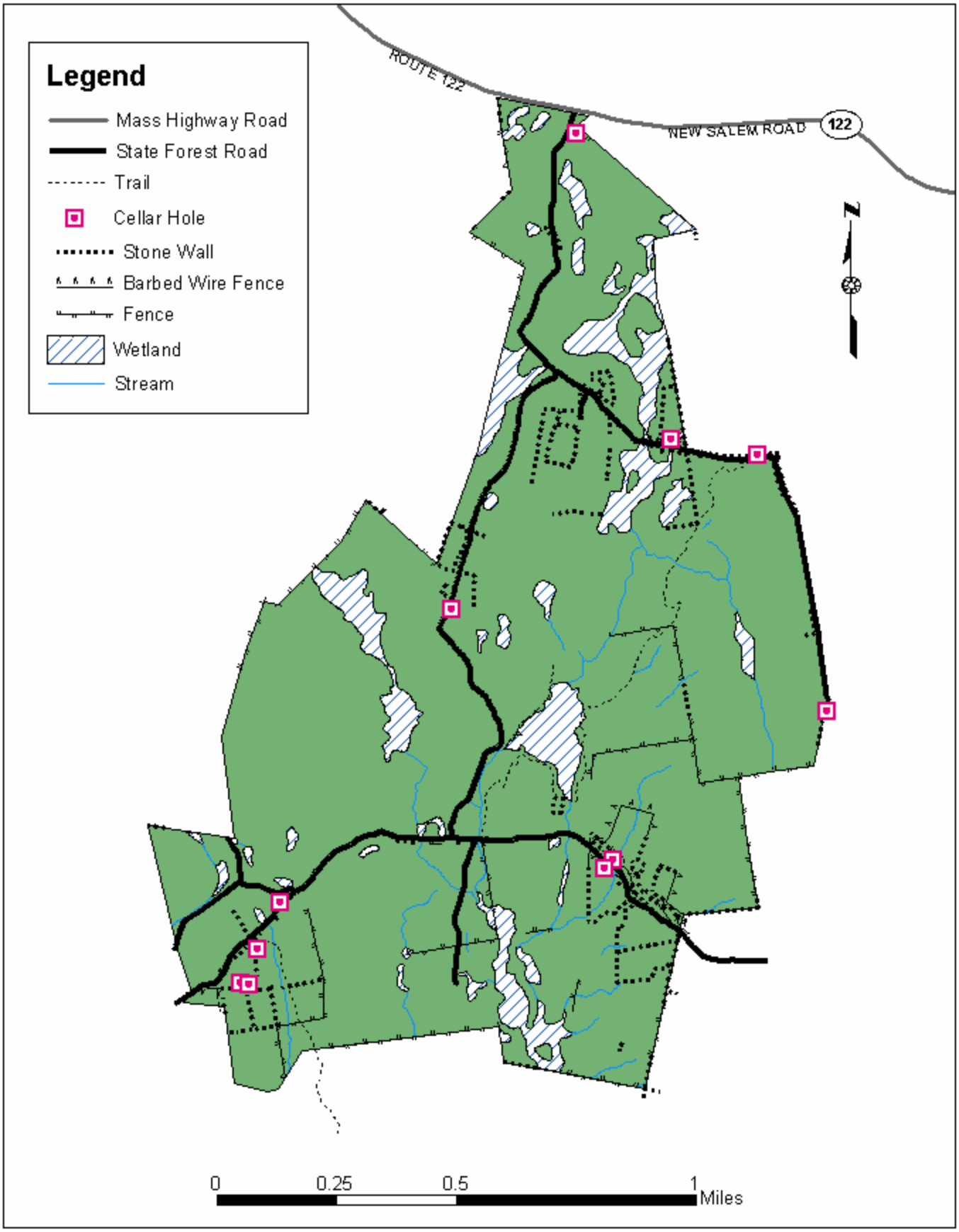

Figure 09
Infrastructure and Recreation

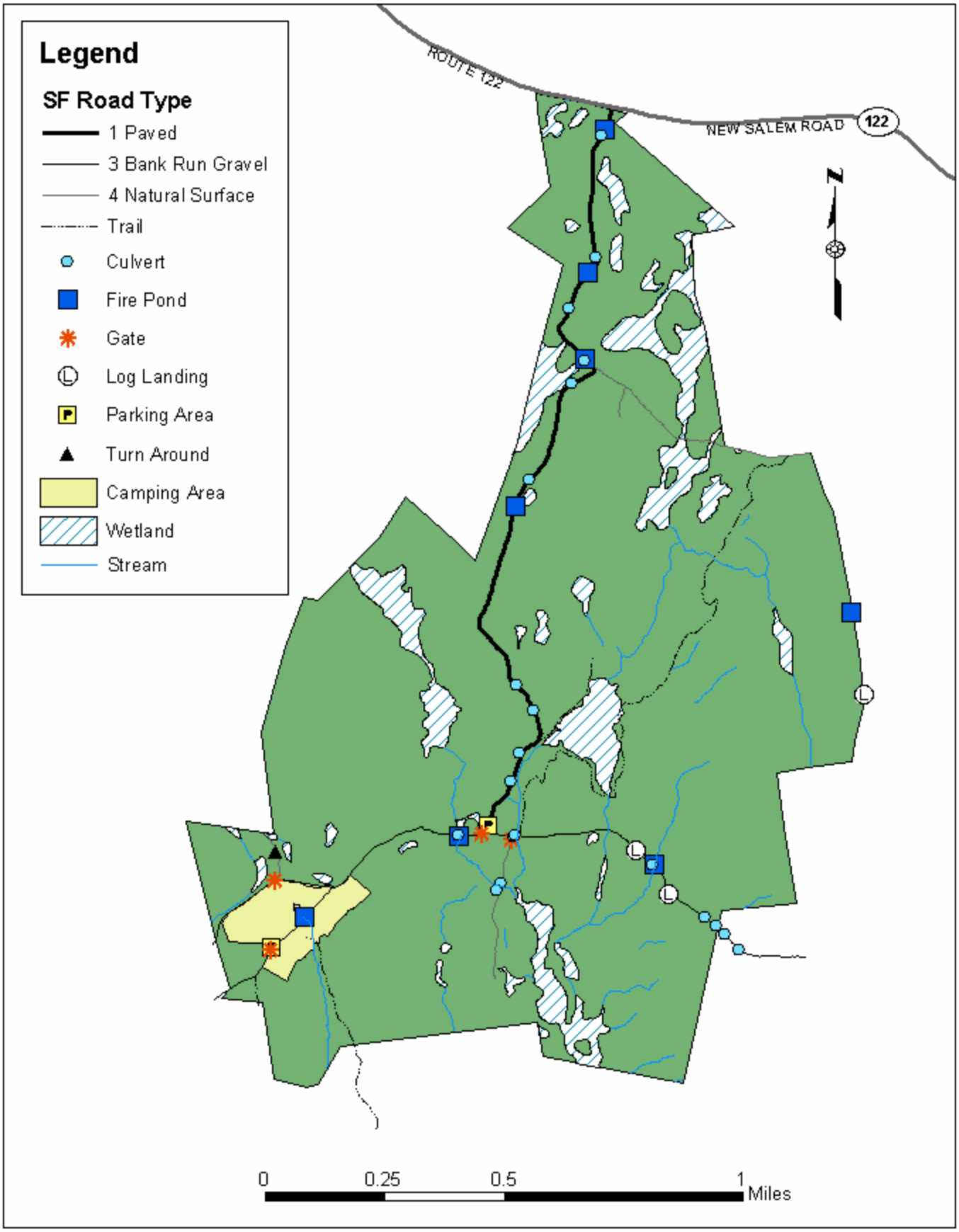

Figure 09A – FWC Road Classification

The following chart refers to the road section numbers shown on Figure 09.

Section Number	Road Classification	Distance (miles)
1	1AB 1BA	.61
2	3CB 4DA	.34
3	3CB 4DA	.18
4	3CB 4DA	.53
5	4DA 4DA	.07
6	1AB 1BA	1.14
7	3AB 3BA	.57
8	3BC 4DC	.31
9	3AC 3BC	.37
10	3AC 3BC	.32
11	4BC 4CC	.10
12	3AC 3BC	.32
13	3AB 3BA	.21

See Appendix B – Management Practices, Management Practice 6 – Road Maintenance and Closures for Road Classification description.

Figure 10
Percent of Species Composition in Hemlock

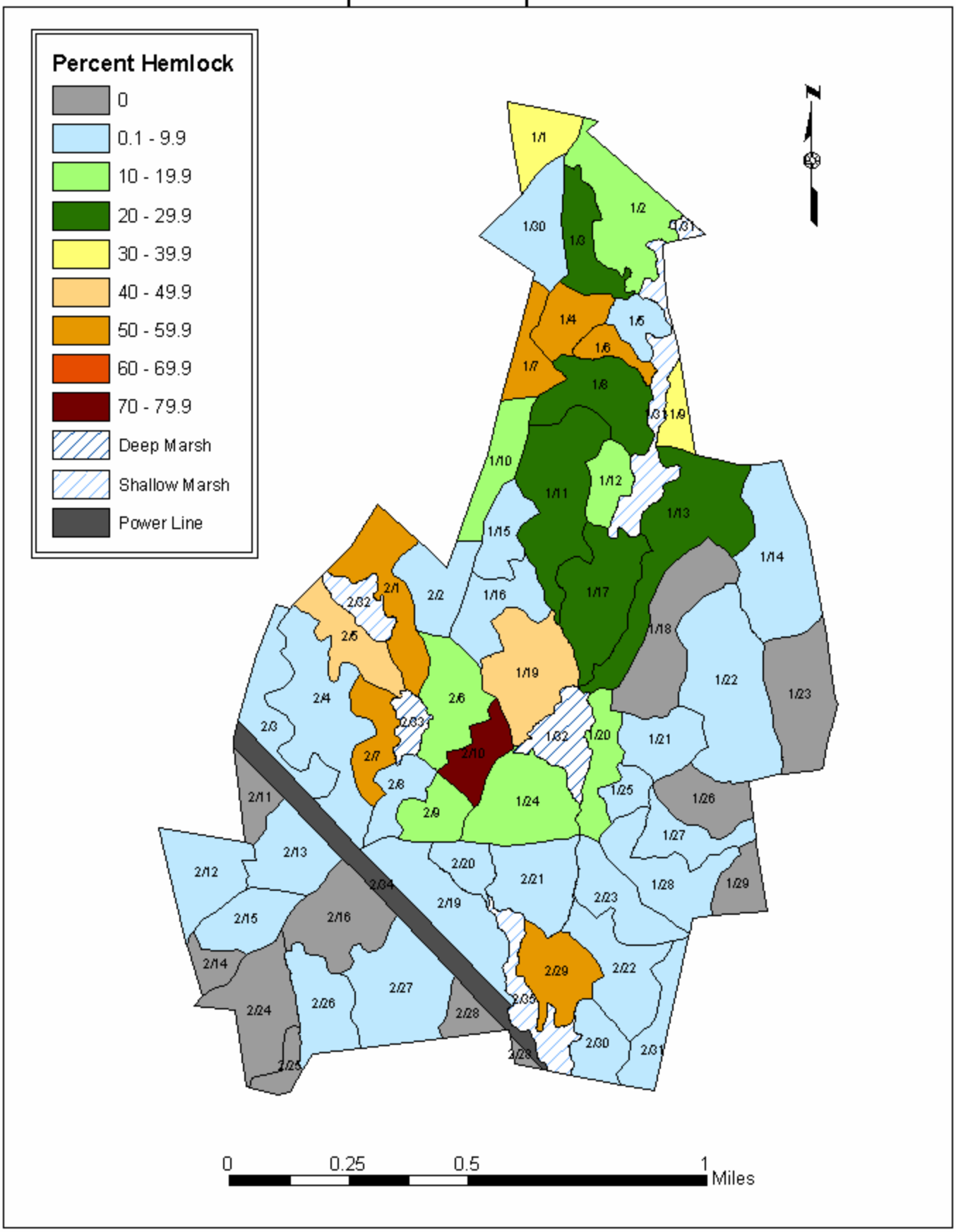

Figure 11
Known Occurences of Exotic Invasive Plants

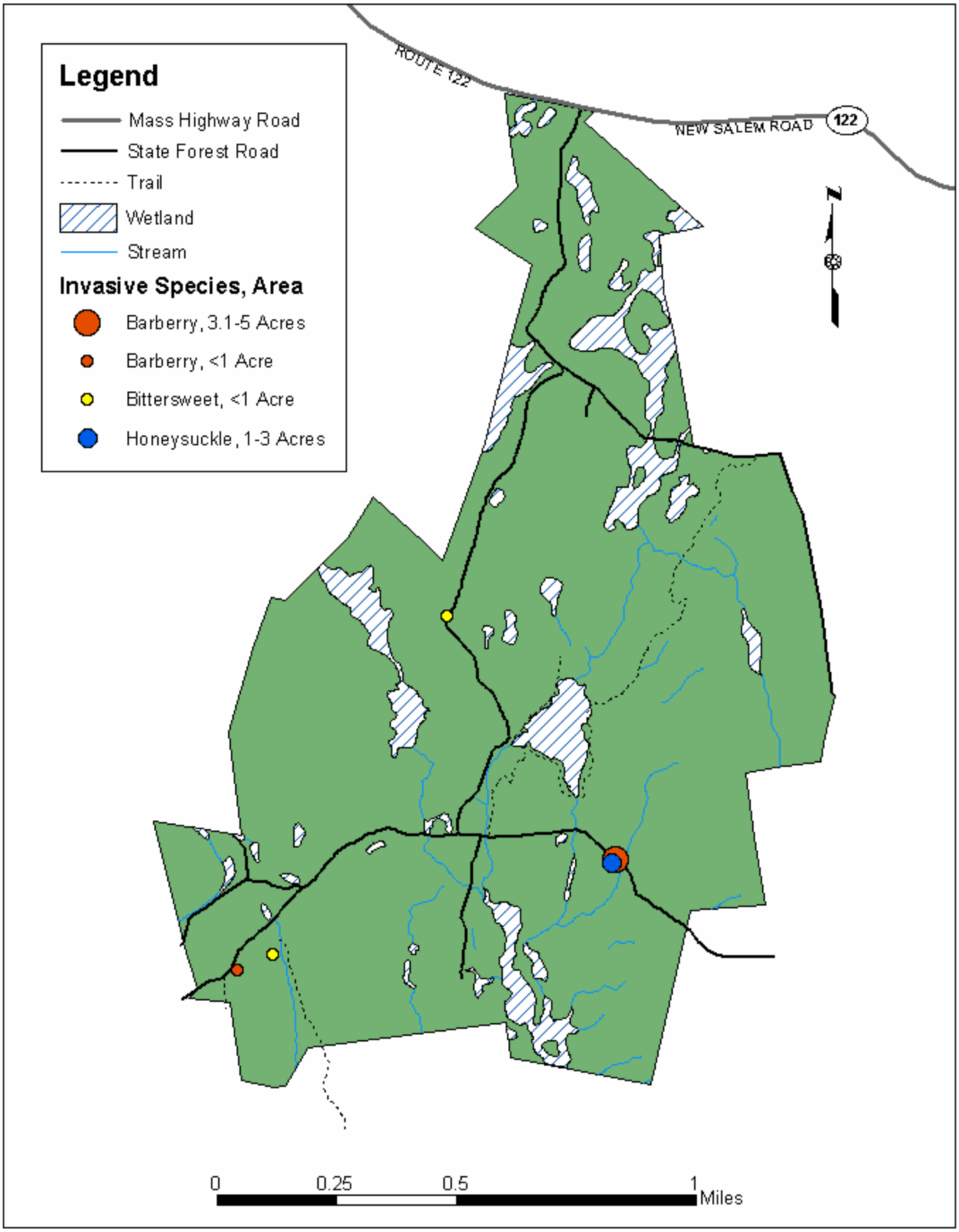

Figure 12
Wetland Classification

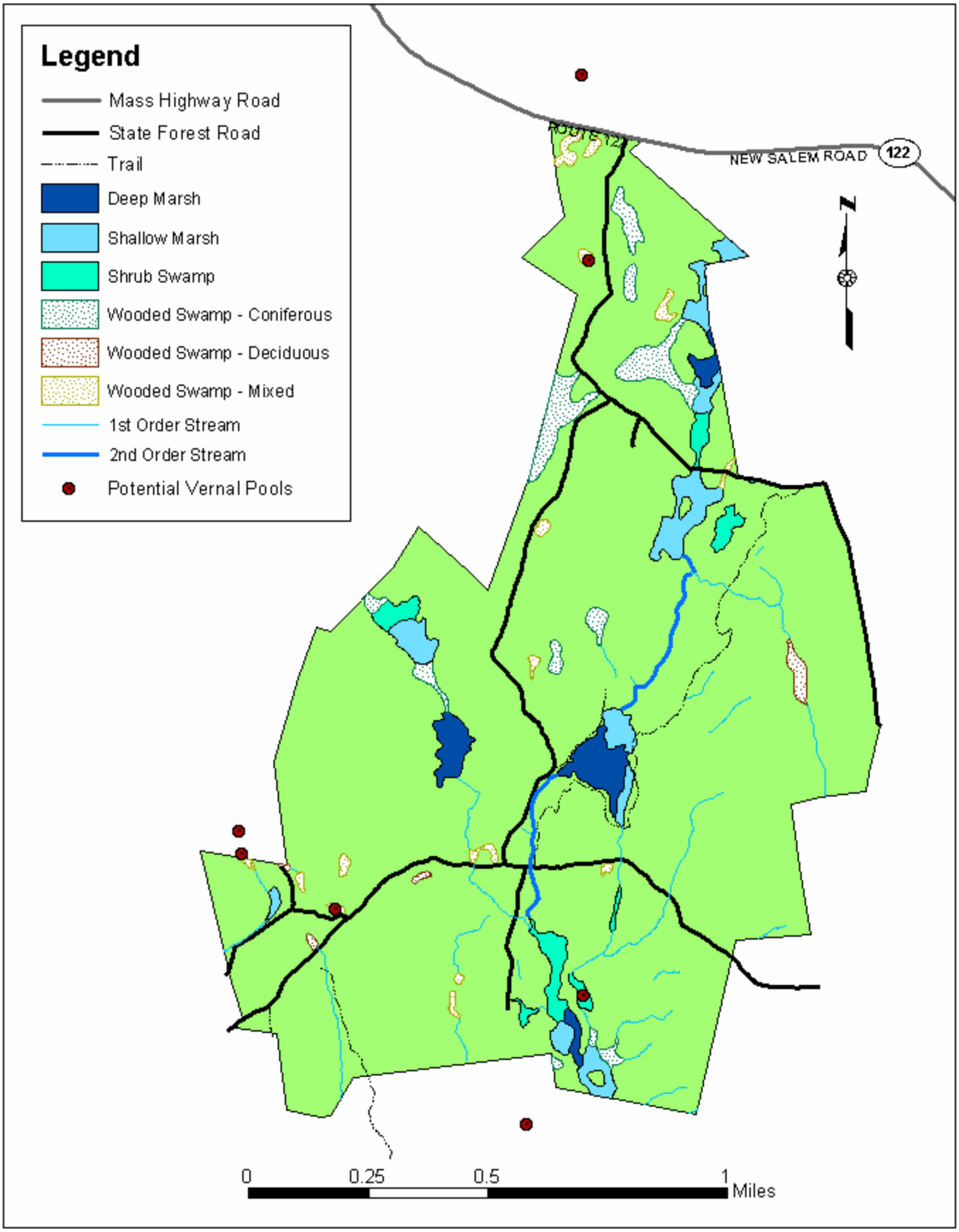

Figure 13
Soil Productivity

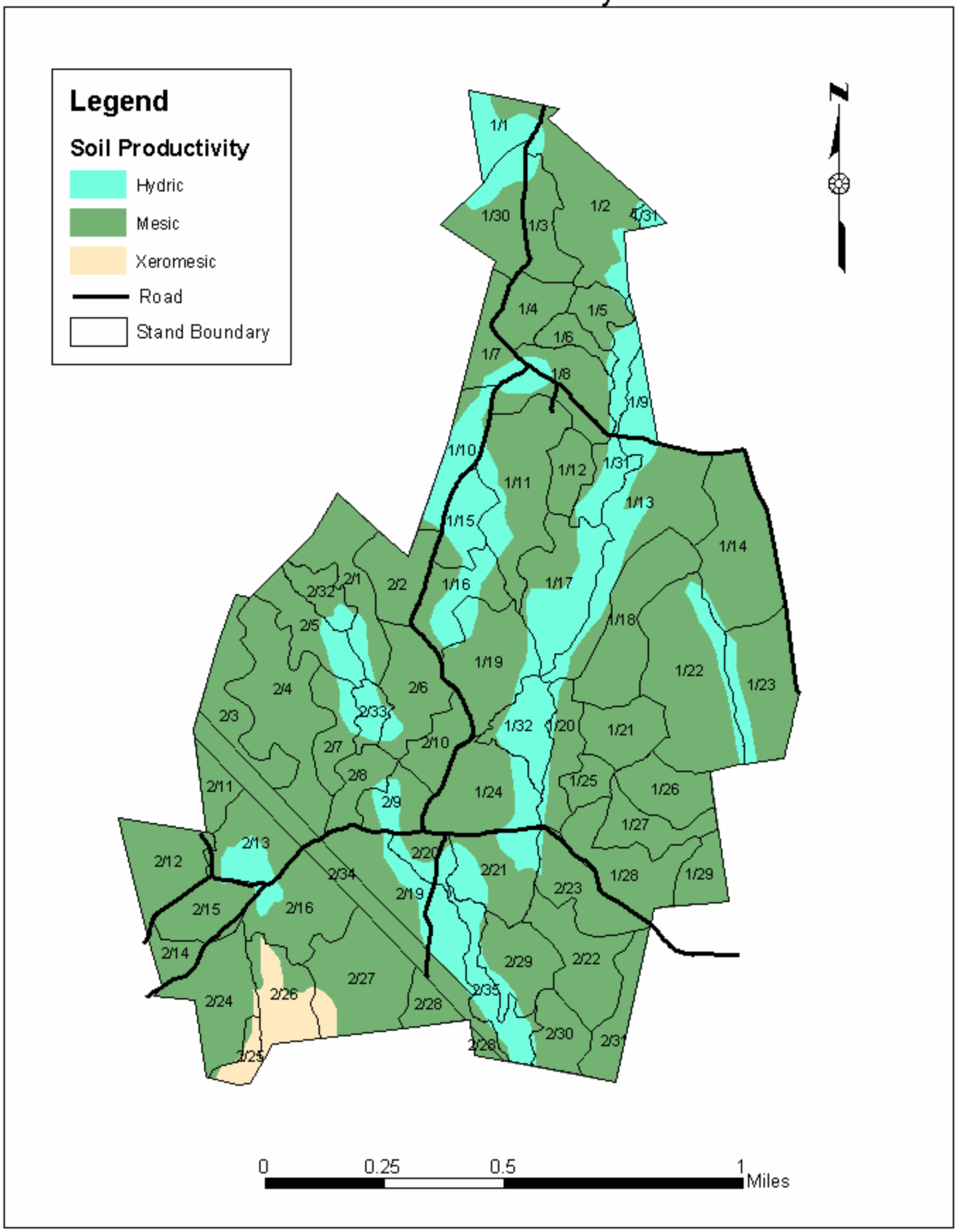

Figure 14
Special Features

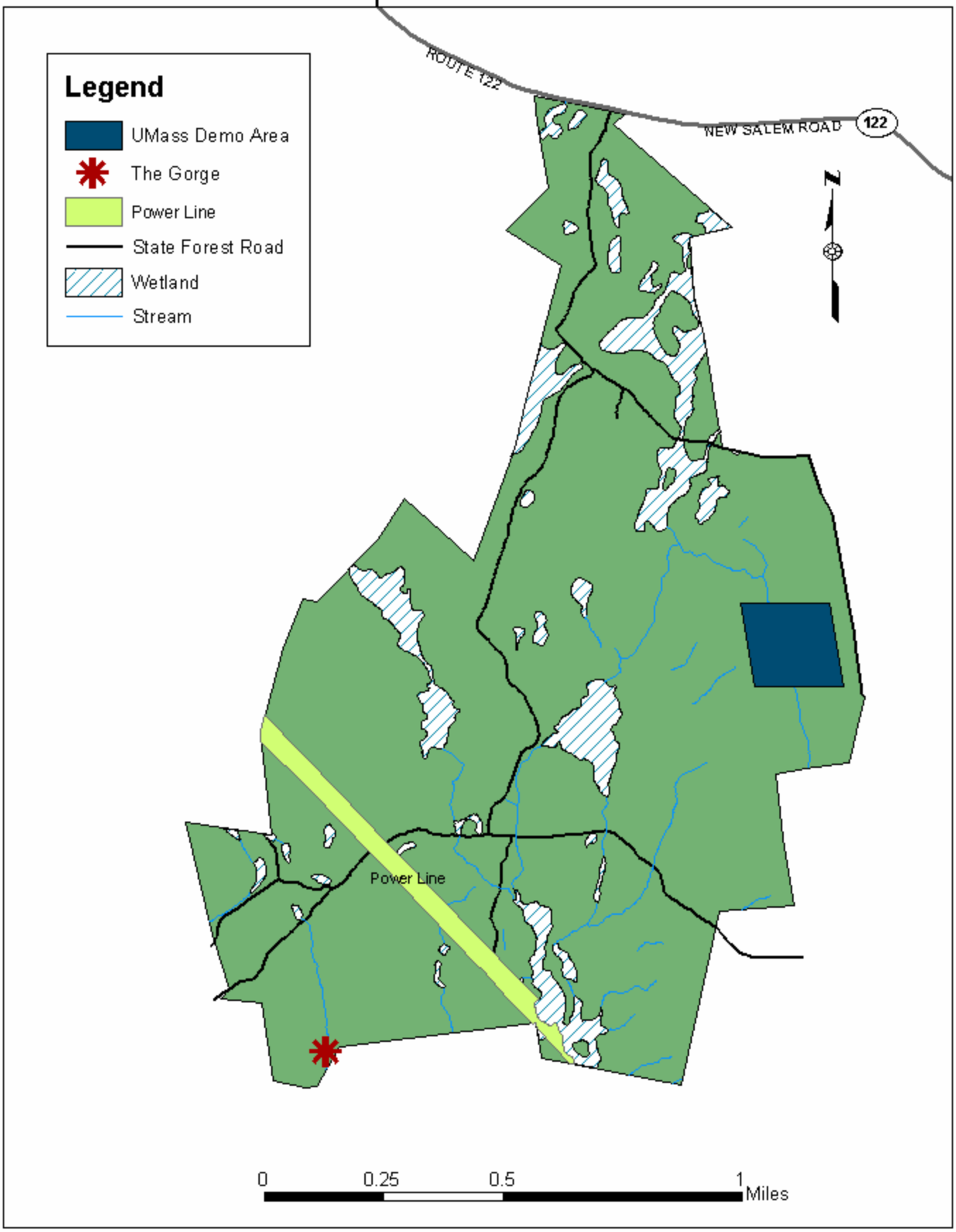

Figure 15
Natural Heritage Priority / Estimated Habitat

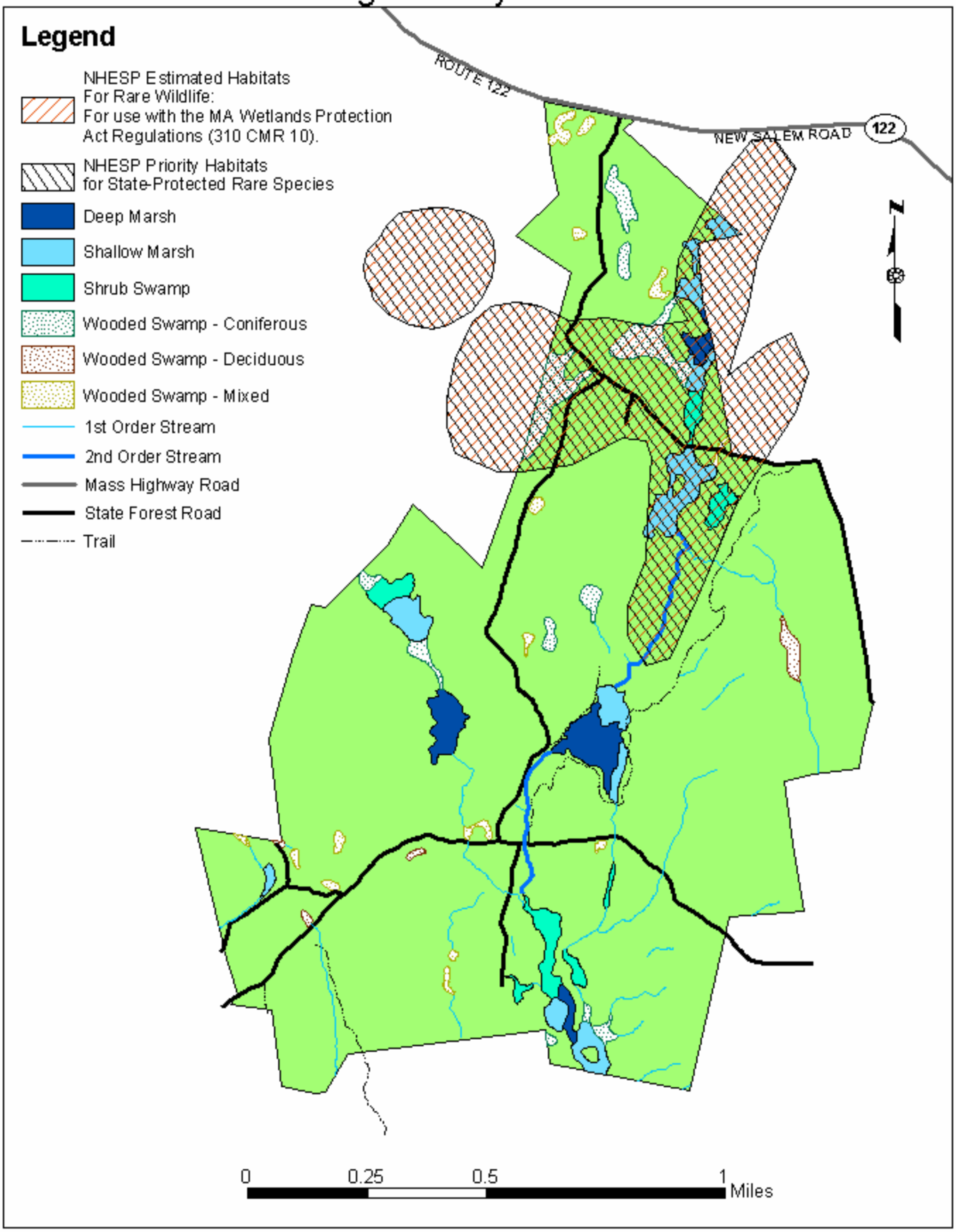

Figure 16
Interior Forest Habitat

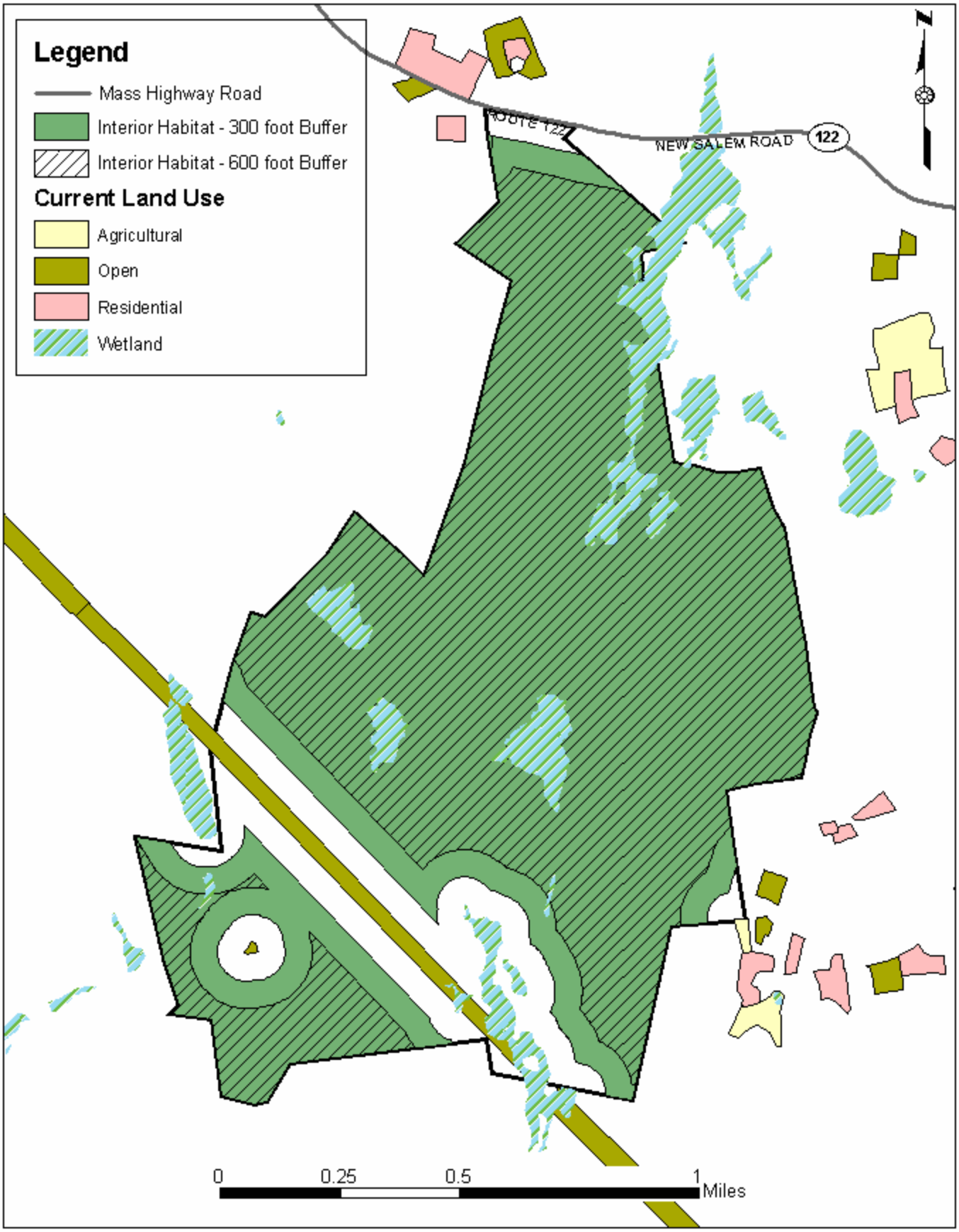

Figure 17
Forest Products Harvesting 1988-2003

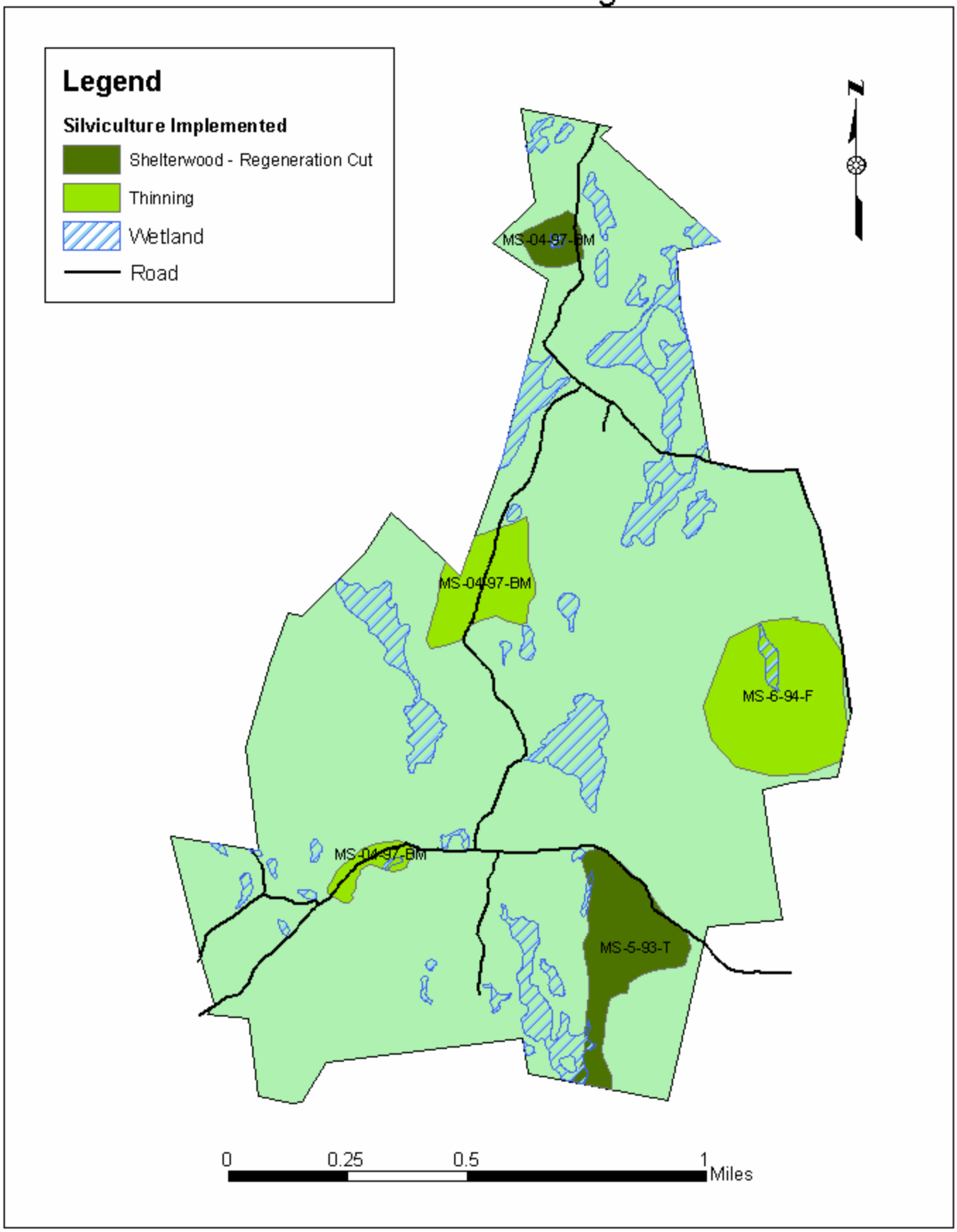

Figure 18
Stands Considered for Regeneration Release Harvesting

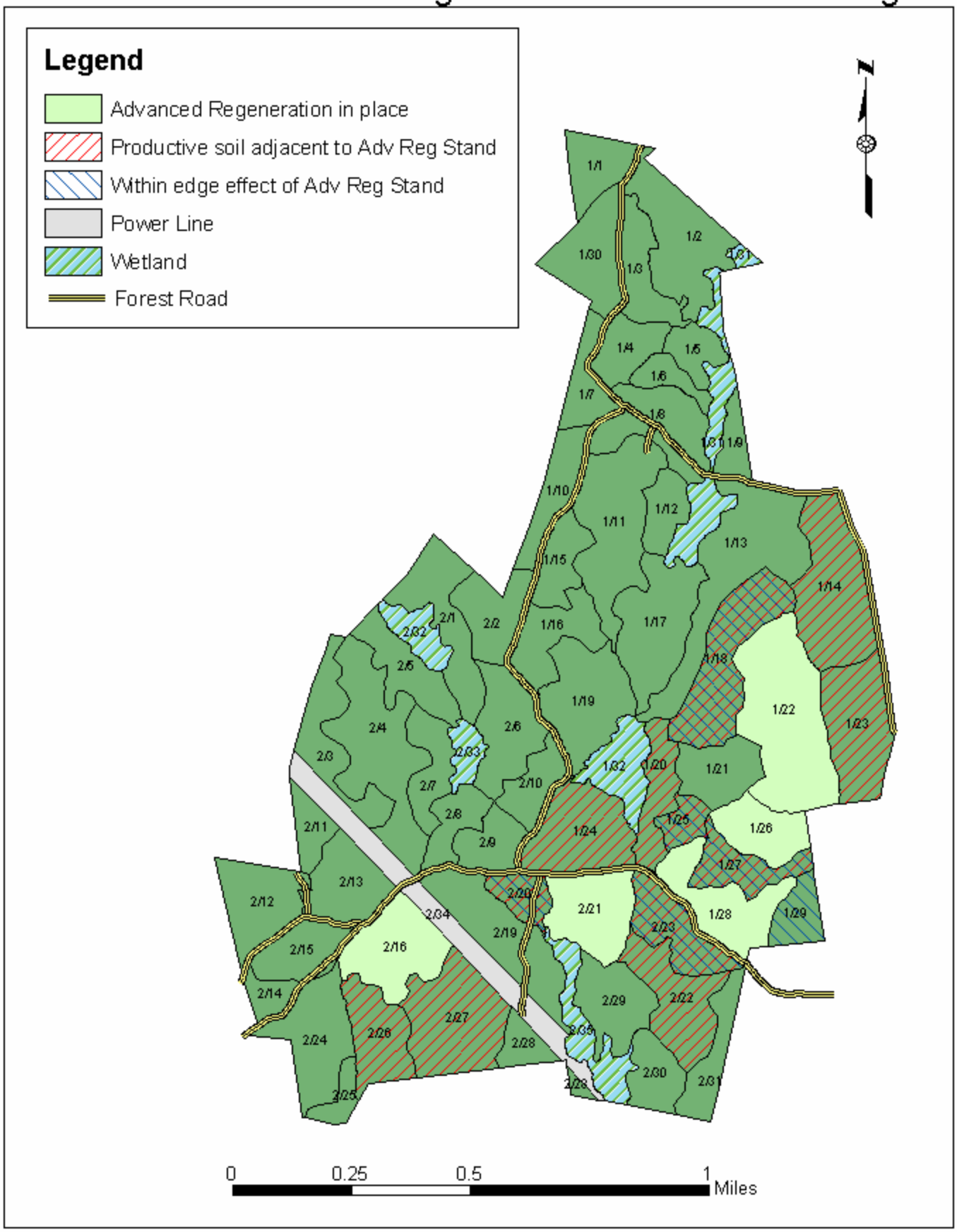

Figure 19
Potential Stands for Regeneration Release Harvesting

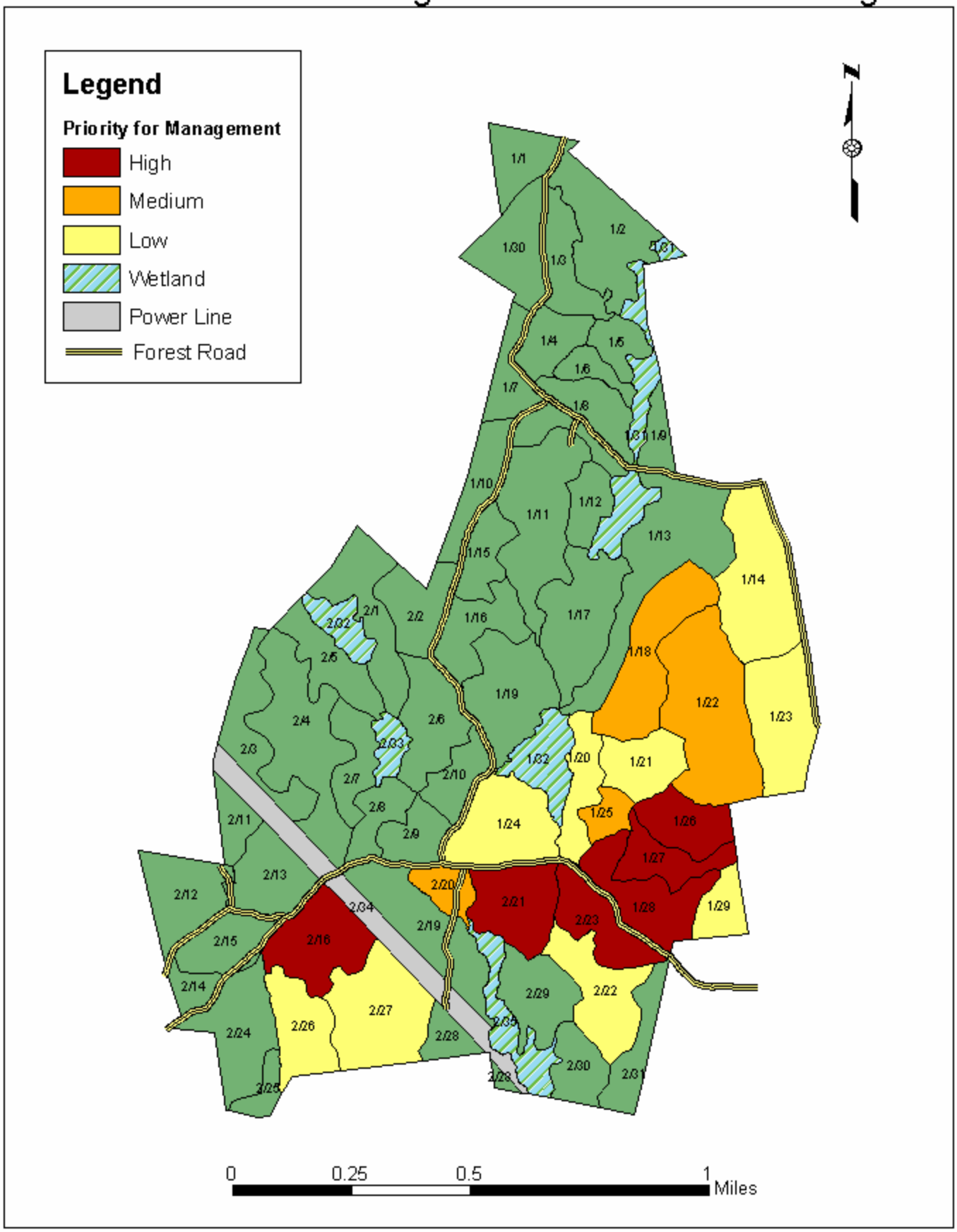

Figure 20
Stands Considered for Regeneration Establishment Harvesting

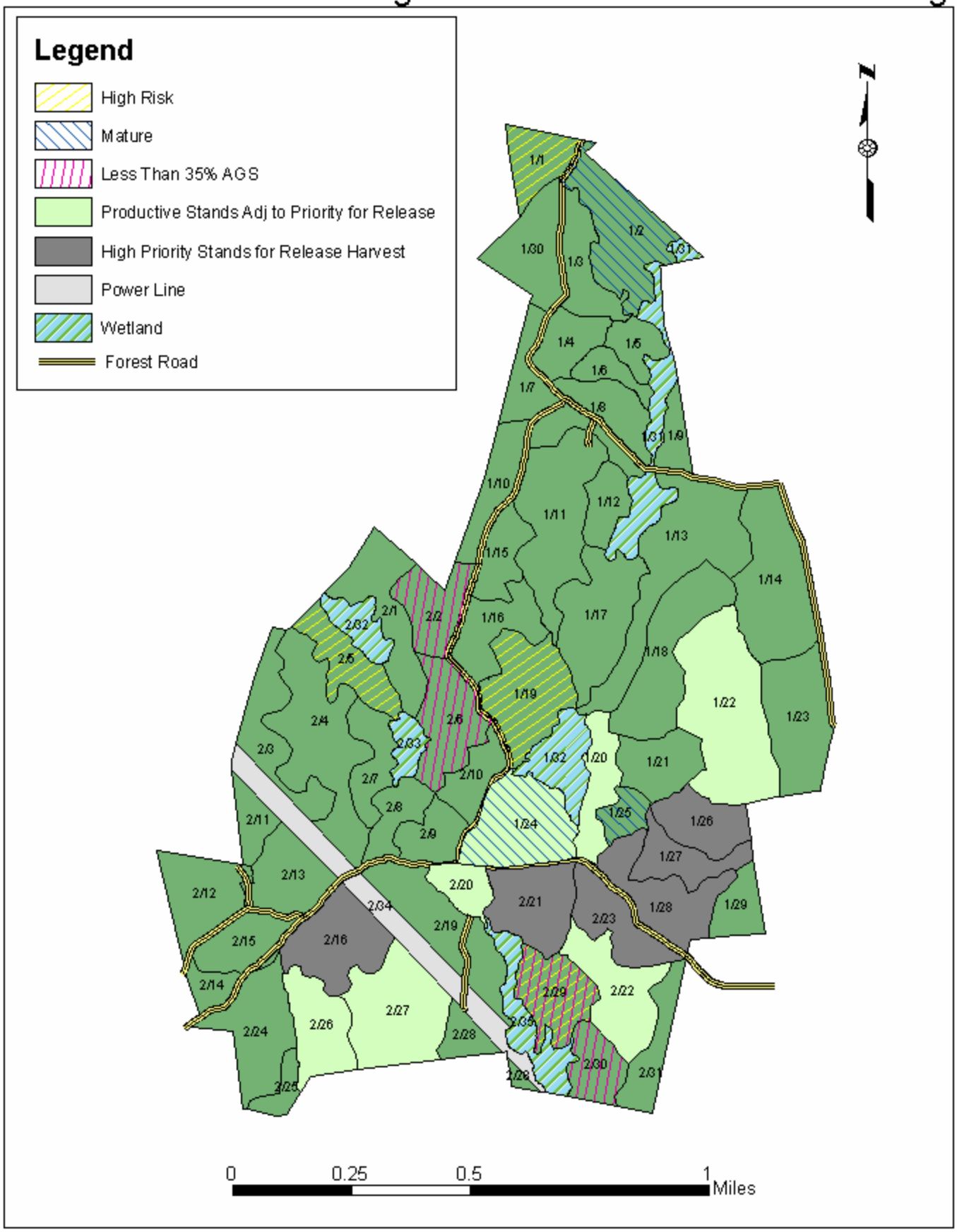

Figure 21
Potential Stands for Regeneration Establishment Harvesting

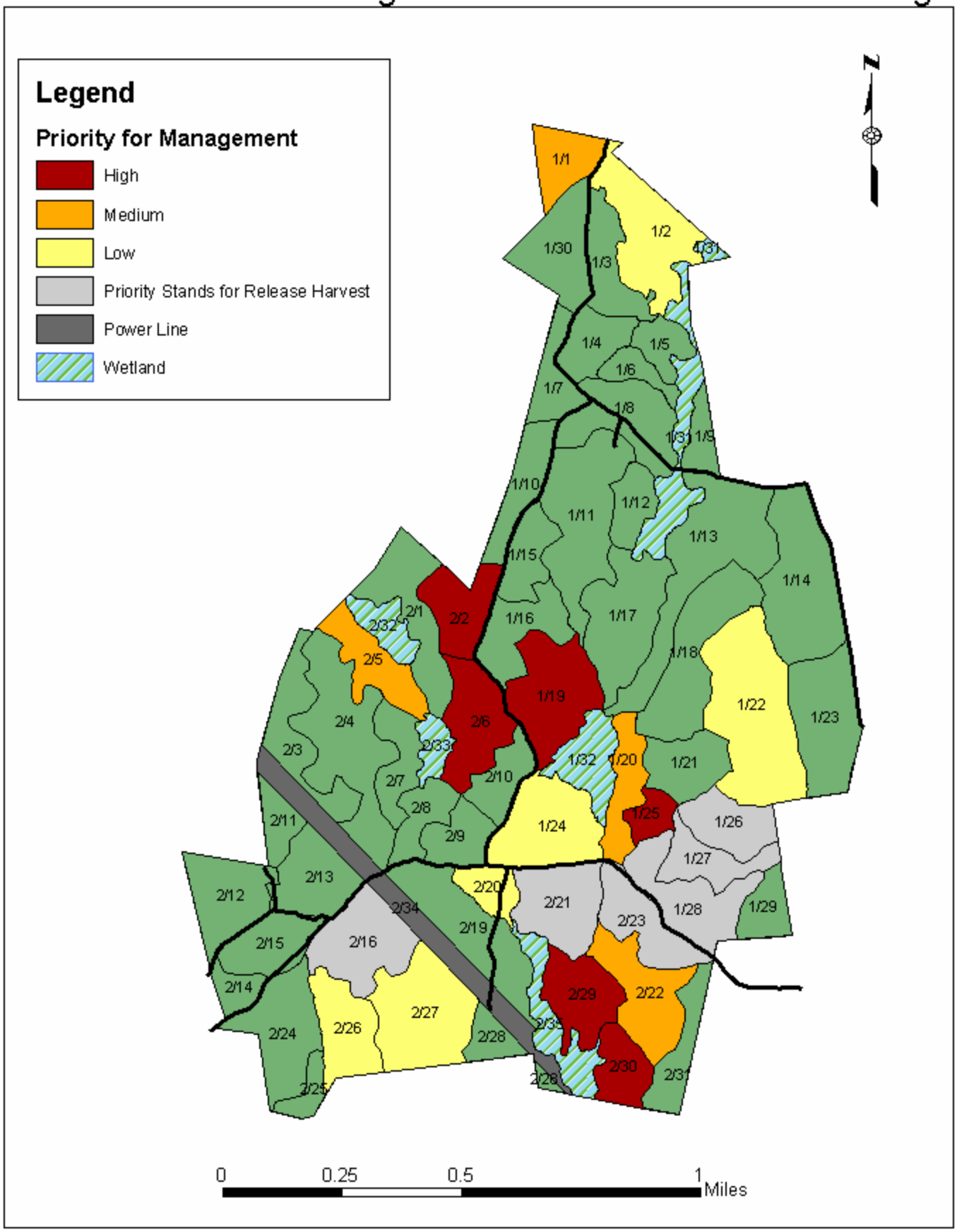

Figure 22
Stands Considered For Intermediate Harvesting

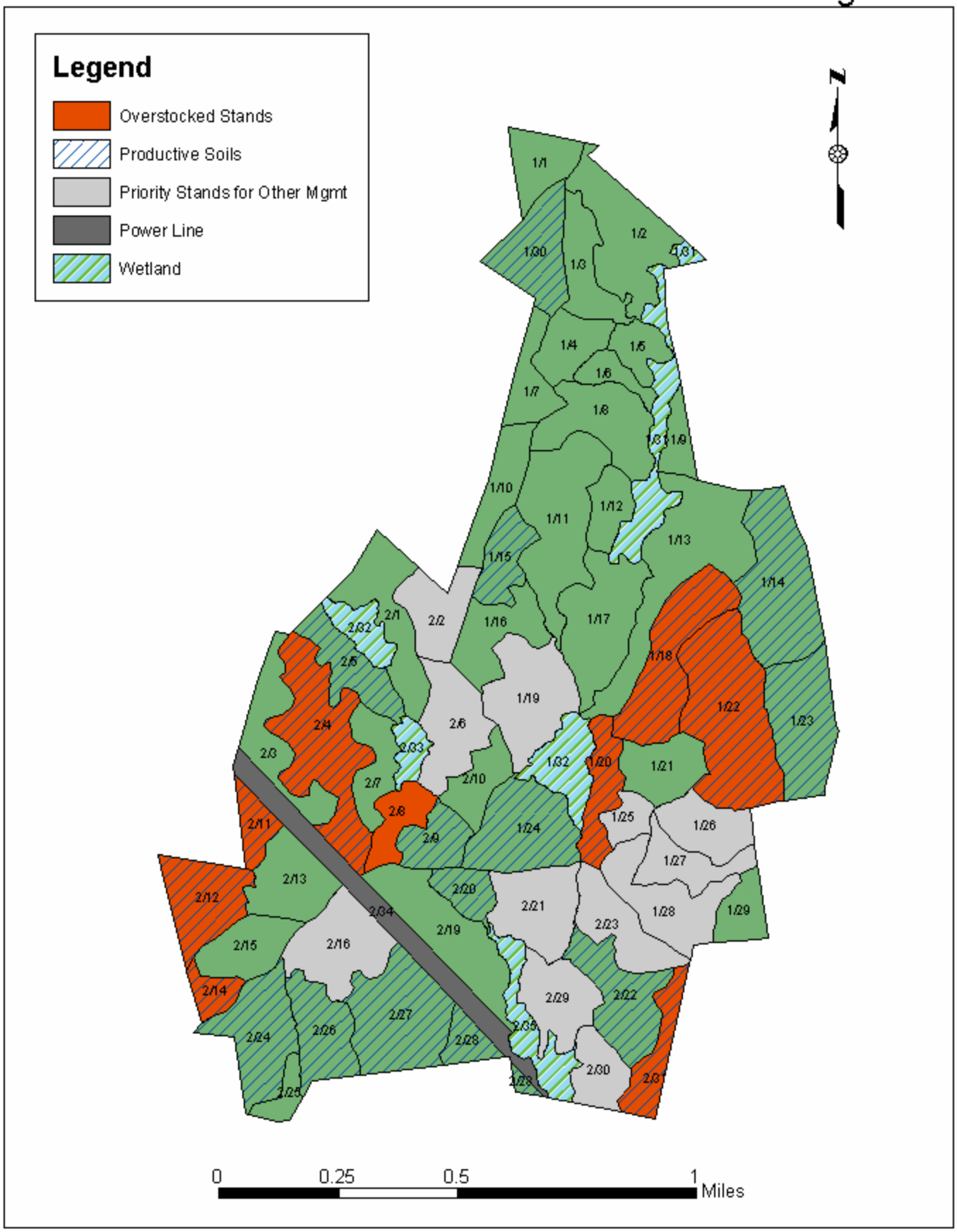

Figure 23
Potential Stands for Intermediate Harvesting

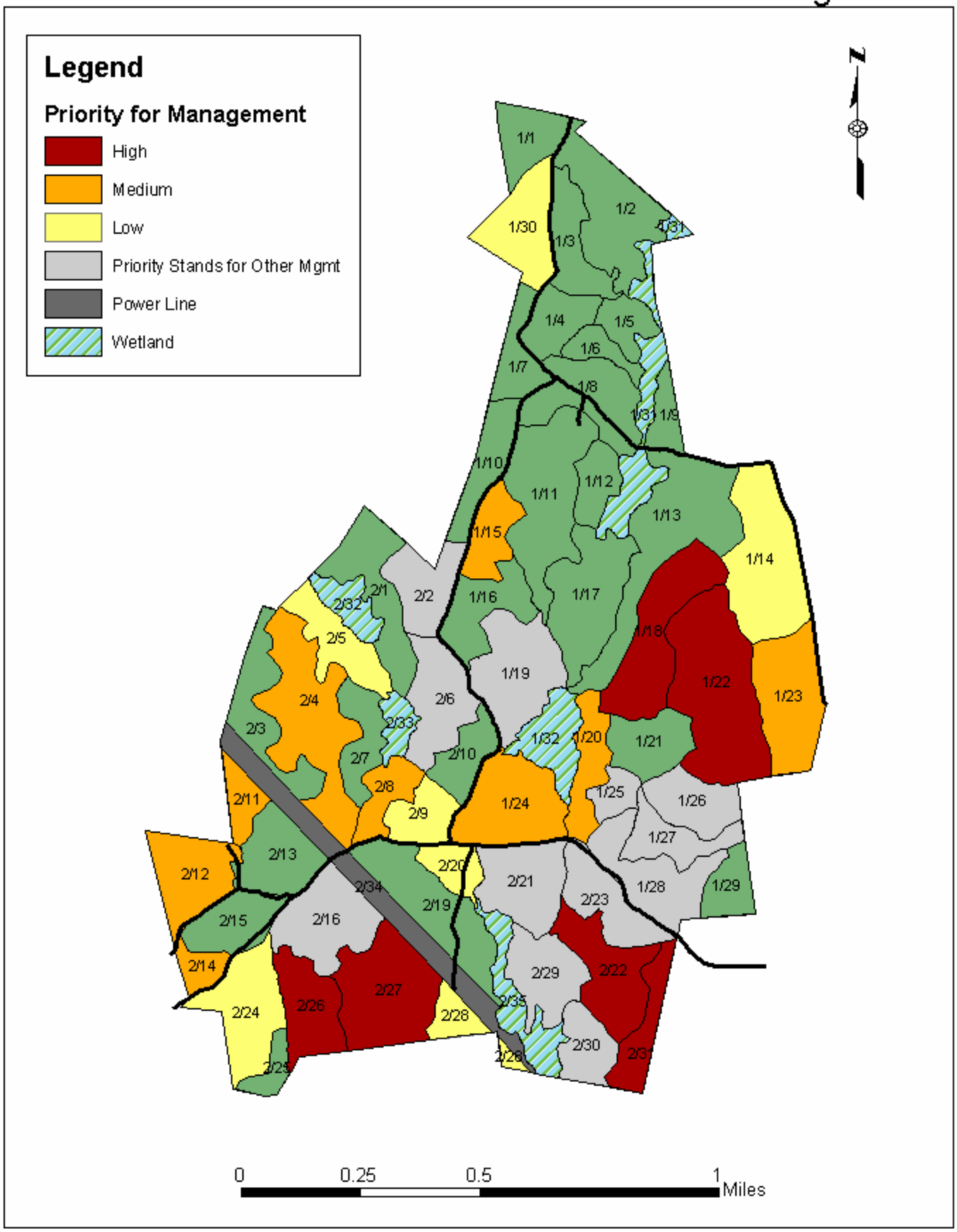

Figure 24
Stands Considered High Priority for Silvicultural Management

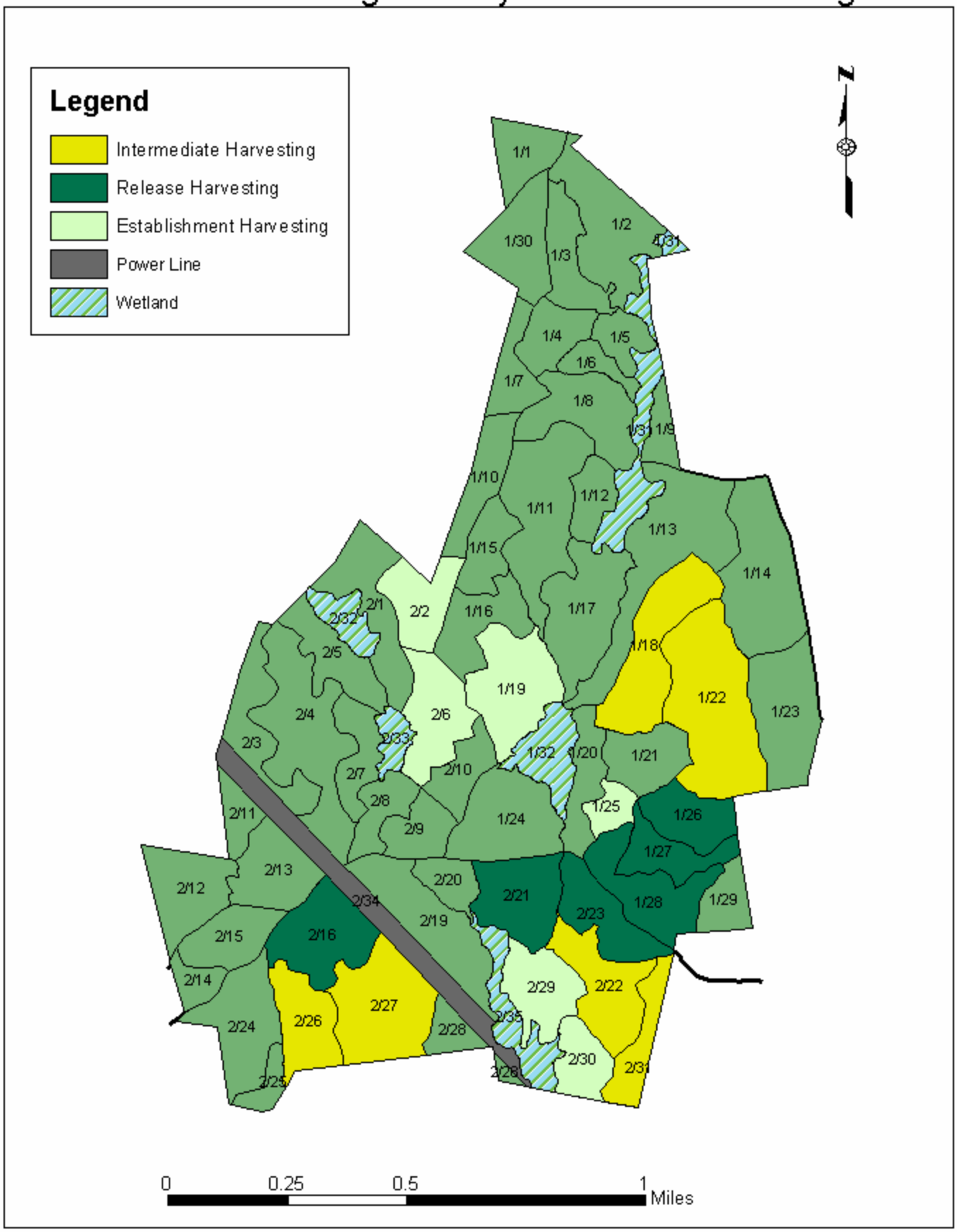

Figure 25
Management Practices for 2004-2018